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By Harvey Cushing, M.D., C.B., F.R.C.S. (Hon.),
PROFESSOR OF SURGERY, HARVARD UNIVERSITY.

Localisation of Function in the Interbrain.

PART II.*

It can be gathered from what has gone before that indications of posterior lobe participation in our several hypophysial tumour-syndromes are, to say the least, inconspicuous, and what slight evidence of such participation there may be has been lost sight of owing to the recent diversion of our attention to the adjacent walls of the third ventricle. To this region we may now return, for there are other symptoms than the polyuria and adiposity already briefly considered, such as sugar metabolism, the thermo-regulatory mechanism, and the phenomenon of sleep, with which in the past the pituitary body had supposedly had something to do, and which it may yet prove to have.

When one speaks of localisation of function in a given part of the brain, it means nothing more than that the nerve centres, which are the primary receiving or discharging stations for impulses from or to other structures, are more or less clustered, and it was with the localised accumulations of cells in the cerebral cortex that experimental neuro-physiologists largely concerned themselves from the time of Fritsch and Hitzig and of Ferrier, until with Sherrington's decerebration experiments the study of the deeper and older parts of the brain really began.

What happened, for example, when the precentral gyrus was stimulated, when the calcarine cortex was damaged, when the vestibular nuclei were injured, was easily observed and comparatively easy to understand, but when glycosuria was produced by a puncture of the fourth ventricle, rigidity by decerebration or, as now, polyuria or adiposity by an injury of the hypothalamic tracts or centres, something far more fundamental and complex has occurred. In all instances, however, it may be taken as a principle that some governing function of a given part of the brain on tissues or organs that lie outside of it has been affected, whether by irritation or paralysis.

Now in the case of the diencephalon, we are dealing with an ancient portion of the brain which remains essentially unaltered in all creatures that have a brain at all. More than that, it proves to have direct neural connexions with the first of the organs of internal secretion to become recognisably differentiated and on which, as we have seen, the very perpetuation of the species depends. That structures in such close anatomical juxtaposition should be functionally independent would seem most improbable, even though we disregard their remote ancestry and demonstrable relationship.

DIABETES INSIPIDUS.

Something has already been said of the presumed mechanism of the hypophysial polyurias in the brief discussion of the antidiuretic properties of posterior lobe extract. Now that the position of the major hypothalamic nuclei are coming to be better understood both in experimental animals and man through such orderly studies as those of Malone (1910–1914) and of Rioch (1930), we may expect that someone soon will definitely determine the locus of the nuclear degenerations in those simpler cases of diabetes insipidus that are unaccompanied by tumours and which are supposedly post-encephalitic in origin. Though studies have already been made in this direction[1] and evidence favours the nucleus supraopticus, we do not yet know with certainty which of the two more important hypothalamic cell masses, this or the nucleus paraventricularis, is involved in the disorder, nor do the reports of experimental polyuria produced by hypothalamic punctures in the dog give us satisfactory histological information on this score. Certainly in none of these experiments could either of the bilaterally placed nuclei have been completely destroyed, and the tuberal nuclei, so far as can be determined, do not represent the source of the main fibre tracts that pass down the stalk to the posterior lobe.

Reports have been made by Levy[2] (1924) of retrograde alterations in the cells of the tuberal nuclei, and by Kary[3] (1924) of changes in the nucleus supraopticus after experimental injury of the canine posterior lobe, but what will prove more illuminating than the identification of such nuclear changes doubtless lies ahead of us in the pursuit of the secondary tract degenerations. The studies by Dr. Maddock of the tissues from his dog with experimental diabetes insipidus, which show an absence of nerve-fibres distal to the point of application of the clip, are, so far as I know, the first in which these secondary degenerations have been investigated.

What is known as the chiasmal syndrome leads surgeons nowadays to the frequent exposure of this region; and as will be subsequently pointed out, neurosurgical evidence strongly favours the nucleus supraopticus as the controlling centre for water metabolism. All this is in correspondence with the view that an experimental injury of the diencephalic part of the mechanism in question gives the most pronounced and enduring reaction. But there is no gainsaying that posterior lobe extirpations in the absence of tuberal injury will also produce the same diuretic response albeit a less striking one; and this P. E. Smith tells me he has observed in his hypophysectomies on the rat. Unfortunately no operation is likely to be devised which will serve to remove the epithelial investment of posterior lobe and tuber and leave the nervous structures intact, but it would probably lead to an intractable polyuria with the same certainty as an injury of the hypothalamic nuclei. It has been shown in Trendelenburg's laboratory (1928) that after extirpation of the posterior lobe the pars tuberalis and tuber cinerum contain an abundance of the antidiuretic and oxytocic substances normally to be found there only in trifling amounts, and that only when the tuber is subsequently destroyed does a persistent polyuria occur.[4]

* Part I. appeared in our last week's issue.

[1] Cf. Eaves, E. C., and Croll, M. M.: The Pituitary and Hypothalamic Region in Chronic Epidemic Encephalitis, Brain, 1930, liii., 56. These authors state that severely damaging nuclear lesions are less likely to cause diabetes and obesity than those less severe.

[2] Levy, F. H.: Zentralbl. f. d. ges. Neurol. u. Psych., 1924, xxxvii., 398.

[3] Kary, C.: Virchows Arch. f. path. Anat., 1924, ccliii., 734.

[4] It is regrettable that the symptomatic effects of the canine hypophysectomies by improved methods, as reported by Dandy and Reichert (Bull. Johns Hopkins Hosp., 1925, xxxvii., 1) were not given in greater detail, particularly since the "stump of the infundibulum and the region immediately contiguous" was cauterised in a considerable percentage of cases to ensure destruction of all epithelial elements. Of 13 adult animals so treated, seven showed post-operative glycosuria and only five polyuria, whereas adiposity is not mentioned.

So far, then, as diabetes insipidus is concerned, the evidence at hand seems reasonably convincing that the disorder can be produced by nuclear degeneration from disease, by surgical injuries of the supraoptic region in operations about the chiasm, by the interruption of the nerve tracts in course whether from tuberal tumours, or punctures, by the experimental placement of a compressing clip on the infundibulum, and probably also (could this be accomplished) by complete removal of the epithelial investment which apparently elaborates the posterior lobe secretion—all of which indicates a diencephalo-hypophysial mechanism which can be broken at any one of three principal points—nucleus, fibre tract, and pars intermedia et tuberalis. We nevertheless, in regard to this most carefully studied of all diencephalo-hypophysial reactions, are left in doubt as to whether the phenomenon is stimulatory or paralytic, and the key to the problem may possibly lie in the neglect of the physiologist's contention that posterior lobe extracts have diuretic as well as antidiuretic effects, the former conceivably being the property of the epithelial investment, pars tuberalis in particular.

THE QUESTION OF ADIPOSITY.

An exaggeration of the elemental sensation of thirst is doubtless antecedent to these pathological polyurias just considered, and the imperative and irresistible call to quench it most certainly lies in this primitive region of the brain common to all animals. A no less primitive and equally impelling sensation is that of hunger, of which less has been said and written in connexion with the neuropituitary mechanisms. Patients with hypopituitarism, though they often become adipose, are notably small eaters, while acromegalics, on the contrary, often have a ravenous appetite scarcely appeased by five generous meals a day. This also was observed by Putnam, Teel, and Benedict in their dogs with experimentally induced overgrowth. In both states the sensation probably has something to do with the level of metabolism which is consistently low in hypopituitary, high in hyperpituitary states, but whence it originates (unless in the interbrain) is less clear.

Polyuria and its antecedent polydipsia are striking symptoms, often so abrupt in onset they can hardly escape notice. The acquirement of obesity, on the other hand, is an insidious process less likely to be observed and of which hunger is not a measure in the sense that thirst is of diabetes insipidus. It consequently presents an even more difficult problem than does that relating to the water balance, though there is little question but that the two will be found to have a similar explanation.

In all that has been written about fat metabolism in relation to the hypophysis and hypothalamus, emphasis has been laid almost exclusively on adiposity and little said of emaciation. If the adiposity is a paralytic phenomenon, as some assume polyuria to be, should we not expect to see a significant loss of weight as an irritative phenomenon? The condition of adiposo-genital dystrophy has so long engaged the attention of clinicians, the fact that there are lean as well as fat types of dyspituitarism associated with hypophysial as well as with hypothalamic tumours has not received the attention it deserves.

The tendency to adiposity, which first came to be recognised (1909) in hypophysectomised dogs and which we attributed to their increased tolerance for carbohydrates, has since been ascribed, as already stated, to accidental lesions of the diencephalon produced in the course of these early and awkwardly made operations. That such injuries frequently occurred there can be no doubt, and now that Smith has shown what extreme degrees of obesity may be produced by tuberal injuries in the rat without the possibility of injury to the gland itself, the question would seem to be decided. However, in one of Dr. Maddock's tuberal clip-experiments on dogs, after only a transient polyuria, the animal in the course of the succeeding months has become extremely adipose. So it seems to me not inconceivable that interference with the function of pars nervosa et tuberalis by blockage with retention of secretion through cicatricial formation may have had some part in causing the adiposity observed in our early experimental animals.

There remains, therefore, something to be said for the participation of the hypophysis in the mechanism of fat metabolism, and Smith himself admits that extirpation of the rat's gland in the absence of tuberal injury leads in time to a certain degree of adiposity, even though it is less striking and prompt in appearance than after tuberal injuries. He nevertheless observed in his early attempts to destroy the rat's hypophysis by the intrasellar injection of a solution of chromic acid that in addition to the usual sequels of experimental ablation of the gland a marked adiposity occurred (and one may assume polyuria also though no mention is made of this) which may conceivably be accounted for by the diffusion of the corrosive along the stalk with destruction of the pars tuberalis without actual damage to hypothalamus. And in this connexion may be recalled the early observations on hypophysectomised tadpoles, a large and persistent fat organ being one of the four striking changes characterising the "pituitaryless" state. In contrast to its disappearance in the normal tadpole, this fat organ persisted in the experimental animals even on starvation, but injections of posterior lobe extract would cause its early absorption. This suggests that a similar treatment might have counteracted the adiposity of Smith's chromic-acid rats.

Though precise figures are not available, it has always been my impression that laboratory animals lost weight when given protracted treatment with posterior lobe extract; the substance may, therefore, be anti-adiposal as well as antidiuretic. It was shown by Coope and Chamberlain (1925) that the injection of pituitrin leads to an accumulation of fat in the liver in the course of eight to nine hours, and subsequent writers have found that the injections cause a disappearance or diminution of blood-fat, together with a decrease in the total fat of the peripheral tissues. Further and highly illuminating studies in this direction have been carried out in Biedl's clinic by William Raab (1926–28) who has found that minute doses of posterior lobe extract (pituitrin) when injected into the cerebral ventricles have a much more marked response in causing disappearance of neutral fat from the blood than when large doses are administered subcutaneously. The fat, meanwhile, is accumulated in the liver where it apparently is transformed. Since this pituitrin-effect is abolished by mechanical destruction of the tuber cinereum, by transection of the cervical cord or by section of the splanchnics as well as by drugs which supposedly paralyse the centres for heat regulation (aspirin, phenacetin, &c.), it was assumed that the extract stimulates the nervous centres of the tuber whence impulses pass, presumably by the descending hypothalamic bundles, to the cord and abdominal sympathetics and thence to the liver. Since it would appear that the normal operation of this neuroglandular apparatus is essential for the storage of such fat as is not immediately utilised by

the body, it is assumed by Raab that any disturbance with the mechanism from hypophysis to liver will lead to an accumulation of fat, in other words, to obesity.

Although in the clinic more marked examples of adiposity are seen in patients with craniopharyngiomas, which may well enough have damaged the tuberal centres, than in patients with strictly intrasellar lesions that have not extruded themselves through the diaphragma, an appreciable adiposity nevertheless occurs in these cases also. So it is that most patients with chromophobe adenomas in whom there is no possibility of tuberal injury (they at least rarely if ever show polyuria) are definitely adipose. A review of the clinical histories of our cases with this point in view reveals that in about 60 per cent. of the females a sudden increase of weight (occasionally extreme but averaging about 20 pounds) had occurred early in the course of the malady more or less coincident with the amenorrhœa and long before the evidences of chiasmal pressure served to call attention to the underlying hypophysial tumour. That the adiposity was not secondary to the amenorrhœa is shown by the fact that in approximately the same proportion of males a corresponding unaccountable early increase in weight had been recorded. The condition is wholly comparable to the effect of an uncomplicated hypophysectomy on the weight of adult animals and it may, in all probability, be ascribed to the obliterative effects of the adenoma on the posterior lobe.

CARBOHYDRATE METABOLISM.

That the pituitary body was in some way related to carbohydrate metabolism was first suggested by the frequent association of acromegaly with diabetes mellitus; and when it subsequently became known that both experimental and clinical states of hypopituitarism showed a surprisingly high tolerance for sugars,[5] this was looked upon as another argument in favour of these states being the converse of acromegaly. Since that time, with the discovery of insulin and the development of ready methods of estimating blood-sugar, an intensive reinvestigation by many interested persons of the entire subject of carbohydrate metabolism has been made, and the pancreatic islets might well enough be looked upon as having the entire matter of sugar disposal under their independent secretory control.

Nevertheless from the time (1858) of Bernard's sugar piqûre to the present day, we have been confronted by the certainty that some neurogenic mechanism lies behind the normal utilisation of this form of food. Efforts have been made more precisely to locate the so-called sugar centre in the fourth ventricle, and Brugsch, Dresel, and Levy have recently (1921) provided evidence that it lies in the dorsal vagus nucleus whence parasympathetic fibres are supposed to pass to the pancreas and sympathetic fibres to the adrenal. However this may be, and doubt has already been cast on their interpretation, the fourth ventricle can be little more than a relay station for impulses producing glycogenolysis that come from higher up. In a long drawn out experimental study of the presumed rôle of the posterior hypophysis in carbohydrate metabolism with Weed and Jacobson as my co-workers[6] we came to believe (1913) that glycogenolysis was produced by the liberation of a pituitary hormone set free by impulses reaching the gland through the cervical autonomic system. These observations have never been repeated and our findings may be capable of other interpretations now that attention has been drawn to the importance of the hypothalamic region whence possibly our glycogenolytic responses originated rather than in the hypophysis itself. One thing, however, we did learn was that the experimental animal must be given the opportunity to store what we called available glycogen if the glycosuric response were to be obtained. Possibly on some such basis may lie the explanation of the fact that transient post-operative glycosurias are rarely observed on patients in the clinic after operations involving hypophysis or third ventricle, for they are usually conducted after at least a twelve-hour fast.

That the glycosurias which occur in approximately one out of every four patients with acromegaly are not an effect of the pituitary tumour in itself, regardless of its type, is further shown by the extreme rarity of glycosuria with pituitary tumours of other sorts; and though the admission must be made that two patients with chromophobe adenomas (out of a series of 200 or more surgically verified lesions of this type) have had coincidental diabetes, glycosuria in the other cases has never been observed even as a transient episode immediately following operation.

The diabetes mellitus of acromegaly, moreover, proves to be notably resistant to treatment by insulin, and it has been repeatedly shown that posterior lobe extract (pituitrin) will diminish or wholly counteract the blood-sugar-reducing effect of this product.[7] Since it is well known that posterior lobe extract produces, at least in animals, a transitory hyperglycæmia and glycosuria, it is a natural assumption that in acromegaly the neural portion of the gland is activated, possibly in connexion with the known tendency of these cases to have a high basal metabolic rate. What is more, the occasional spontaneous recovery from the diabetes mellitus of acromegaly with the continued progress of the underlying disease may point toward the gradual elimination of posterior lobe activity by pressure destruction from the enlarging tumour; and the occasional disappearance of an existent glycosuria after radical extirpation of a chromophilic adenoma suggests the possible resumption of activity in a previously compressed lobe.

With all this, and much of it is purely speculative, there is no gainsaying that the relation of the region in question to sugar diabetes is less evident than to that of water diabetes and to fat metabolism. Though temporary glycosuria may be provoked by experimental hypophysectomies or by hypothalamic injuries on animals, the effect is never prolonged, nor in my experience do operations for lesions of the hypophysis or third ventricle in man lead even to transient glycosuria.

A THERMO-REGULATORY CENTRE.

The existence of such a centre has long been postulated and such facts as we have in hand tend to place it in close relation to the primitive mechanisms under discussion. Indeed, Raab[8] (1926) marshals evidence in favour of its being identical with the mechanism which regulates the normal absorption and oxidation of fat within the liver which he takes

[5] Cf. Goetsch, Cushing, and Jacobson: Bull. Johns Hopkins Hosp., 1911, xxii., 165.

[6] The Autonomic Control of the Pituitary Gland, Johns Hopkins Hosp. Bull., 1913, xxiv., 40.

[7] This insulin-inhibiting effect of posterior lobe extract has been shown by Burn (Quart. Jour. Pharmacol., 1929, i., 509) to lie in vasopressin and not in oxytocin. Houssay and Magenta find that hypophysectomised dogs go into convulsions after smaller doses of insulin than do normal animals.

[8] Raab, W.: Wärmeregulation und Fettstoffwechsel., Zeit. f. d. ges. Exper. Med., 1926, liii., 317.

to be one of the essential factors in heat production. The necessity of a diet rich in fat to sustain warmth in arctic regions and the fat "gland" of hibernating animals on which the animal draws for sustenance during its winter period come immediately to mind.

An interference with thermo-regulatory control may lead to an abnormal fall or rise in body temperature. A well-known example of the former is the marked fall in body temperature after high transection of the spinal cord by wounds; another, the extreme elevation of temperature that occasionally follows intracranial operations. Both conditions are prone to be fatal and in both, in my experience, the victims are likely to feel comfortable and have no consciousness of the altered body temperature.

In the early experimental canine hypophysectomies, which often led to what was called cachexia hypophyscopriva, the gradual fall in temperature to the time of death in the course of five to ten days was often extreme, almost reaching that of the environment. Injections of fresh emulsified gland served as we thought to check the fall or even to re-elevate the temperature, but efforts to re-establish warmth by external applications of heat seemed merely to hasten death. It is a matter of general knowledge that patients with tumours that compress or destroy the posterior lobe, such as the common adenomas of chromophobe type, suffer from cold and have a consistently subnormal body temperature often averaging as low as 97° F. This might possibly have some connexion with their lowered metabolism; and the low body temperature and low metabolism of hibernating animals is proverbial.

Smith has called particular attention to the inability of his hypophysectomised rats to maintain a normal body temperature. One would naturally suppose that in these hypopituitary states a prompt rise in temperature would follow the injection of posterior lobe extract, but as a matter of fact it has, at least at the outset, just the opposite effect. Even if given intravenously, the extract causes, among other effects, a slight fall in temperature, but if injected into the ventricles the effect may be so pronounced as to be nothing short of startling. In one instance the rectal temperature fell to five degrees below normal and this was followed after three or four hours by a wave of pyrexia after which the patient experienced a marked sense of well-being. How to account for this unexpected antipyretic action of the drug is problematical.

Even more striking are the counterposed states of pyrexia. What is known as post-operative hyperthermia has long been a bête noir of neuro-surgeons. It is most likely to occur, particularly in children, after sudden, complete emptying of the ventricles and is one of the most dreaded consequences of radical extirpations of tumours which leave the floor of the dilated fourth ventricle widely exposed and which, at the same time, thoroughly empty the greatly distended and hydrocephalic cerebral ventricles. The body temperature may rise in the course of a few hours to 106° or even 108° F., the extremities meanwhile being so cold and clammy as to mislead the attendants and incline them to apply external heat.

Similar disturbances are known to follow operations for tumours of the third ventricle. I have recently removed a large suprasellar meningioma from a patient with a chiasmal syndrome, who, in the absence of any other post-operative symptoms referable to the third ventricle, for the subsequent ten days had a prolonged unremitting elevation of temperature, unassociated with leucocytosis or any evidence of infection. It was an unaccountable thermic wave almost like the temporary wave of polyuria that may follow one of these operations, slowly to return to normal. Many other examples of this same kind might be given. The fact that these neurogenic hyperthermias are notably influenced by antipyretic drugs which are supposed to act directly on cerebral centres is also of significance.

On experimental grounds, a high and abrupt thermic reaction has been occasionally seen after hypothalamic injuries of various kinds, and such studies as have been made in this direction by my associates have led some of them to believe that a puncture in the region of the corpora mamillaria is more likely than any other to produce them. The whole subject, in short, is one which needs further detailed study, and the recent perfection of an apparatus which will permit of a continuous record of body temperature will make further investigations more precise than was formerly possible.

From what information we have, whether in clinic or laboratory, it would appear that experimental or surgical lesions, whether in third or fourth ventricle, may lead to hyperthermia, and this suggests a pathway from the posterior diencephalon through the descending bundles to the cord, sympathetic nervous system, and viscera. In this connexion we may recall that Cannon's sympathectomised animals were no longer able to regulate their body temperature but became hypothermic in a cold room and hyperthermic in heated ones, due presumably to the fact that regulatory impulses from the hypothalamus had been cut off.

PATHOLOGICAL SLEEP.

On what grounds the tortuous intracranial segments of the internal carotid arteries, whose branches enter the rete mirabile, came to be called "the sleepy arteries" is lost in antiquity, but for some reason or other the idea has prevailed that the function of sleep was ascribable to this region. There seemed to be something more in the idea than pure conjecture, but just what the mechanism of sleep and its alternate phase of waking might be was undetermined. Among theories innumerable, that there may actually be a diencephalic centre for the process has been claimed, and the recent demonstration by Hess [9] (1929) of a definite hypothalamic area in the cat stimulation of which will promptly induce a condition which is indistinguishable from sleep points suggestively in this direction.

Then, too, we have had before us, these past 15 years, the all too common examples of lethargy associated with encephalitis, a malady whose effects are prone to strike at this particular part of the brain as shown by other symptoms unmistakably hypothalamic in origin. Accordingly, the not uncommon clinical states of periodic somnolence called narcolepsy, which are characterised, in the absence of any other symptoms, by periods of sudden irresistible drowsiness and weakness, are commonly regarded as post-encephalitic disturbances akin to parkinsonianism. And it is not without interest that patients, in whom these states of narcolepsy occur, oftentimes coincidentally become abnormally adipose. Pathological somnolence is also prone to accompany such of the craniopharyngiomas as cause deformations of the third ventricle, but it is a still more common feature of what has been called the hypersomnic form of brain tumour [10].

[9] Hess, W. R.: The Mechanism of Sleep, Amer. Jour. Physiol., 1929, xc., 386.

[10] A series of striking cases of this sort has been reported from the writer's clinic by J. F. Fulton and P. Bailey: Jour. Nerv. and Ment. Dis., 1929, lxix., 1, et seq., with complete bibliography of the subject.

namely, the gliomatous lesions that arise from the walls of the third ventricle.

Thus it would appear that pathological sleep, and conversely of course abnormal wakefulness, in all probability are states induced by a disordered function of the hypothalamus, but we cannot at the same time lose sight of the fact that somnolence is also a characterising feature of many pituitary disorders in which the diencephalon can by no possibility have sustained direct damage. This is particularly true again of the chromophobe adenomas which are often associated with a notable drowsiness which 16 hours of sleep out of the 24 will sometimes scarcely satisfy; and the fact that polyuria is rarely seen in these cases would further emphasise the fact that the diencephalon has escaped injury.

There is another thing about sleep that deserved consideration—namely, its rhythmical periodicity. Cyclicism, which may be diurnal, lunar, or seasonal, is a peculiarity of many physiological processes. The unaccountable periodicity of œstrus and of menstruation, of rutting, and of hibernation are examples. That these cyclic occurrences are primitive and fundamental to the species there can be no question. The sloth awakens merely to take food and procreate. Hibernating or estivating creatures pass whole seasons unfavourable for sustenance with their metabolic processes so far slowed down they can survive meanwhile on their own tissues. That these processes are somehow under the control of this ancestral diencephalo-hypophysial apparatus seems most probable, for it at least accounts best for many of the physiological changes that are known to occur during sleep.

Some years ago (1915) the attempt was made in collaboration with Emil Goetsch[11] definitely to pin hibernation on the pituitary body, but our opportunities for putting it to a conclusive test were inadequate. Unquestionably the secretory apparatus that controls tissue metabolism must be essentially inactive during hibernation just as it is relatively so in hypopituitary states, and since the hypophysis plays an even more definite governing rôle in these processes than we then ventured to believe, it would seem highly probable that winter sleep is made possible by the seasonal switching off of a diencephalo-pituitary mechanism which leads to sleep, oliguria, poikilothermia, slowed pulse and respiration, and the consumption of stored tissue fat at its lowest rate. And it may also be noted that on awakening from the hibernating state almost certainly from resumption of the activity of the anterior hypophysis and its influence on sex, the mating or rutting season usually sets in.

On the grounds of clinical experience, one must concede that after operations for hypophysial tumours, however radical they may be, post-operative hypersomnia is rarely seen. Only after operations in which the floor of the third ventricle has been subject to contusion, and only infrequently then, do we see evidence of pathological sleep of such prolonged nature as to excite comment. In a recent case after the removal of an unusually large olfactory groove meningioma which so far overlapped the chiasm and sella turcica as to cause marked deformity of the third ventricle, the patient during the course of the operation under local anæsthesia went into a profound, motionless sleep from which she did not gradually awake until nearly two weeks later. On the other hand, in the few cases in my experience in which tumours have been successfully removed from the cavity of the third ventricle, there has been no post-operative tendency either to abnormal drowsiness or wakefulness in spite of the inevitable contusion of the ventricular walls.

[11] Jour. Exper. Med., 1915, xxii., 25.

Diencephalo-sympathetic Mechanisms.

From what has preceded, the tendency to overload the third ventricle with functional responsibilities already begins to be apparent. What is more, there is an irresistible temptation anatomically to allocate these several functions in specific centres.[12] Whether this is wholly justifiable may be doubted, though we need not forget the rôle phrenology once played in adjusting us to the idea of localisation of function in the cerebral cortex. In addition to its highly important relation to the vegetative nervous system, the hypothalamus has come to be looked upon as a place where "emotional reactions are integrated." The uninhibited reactions of Goltz's famous partly decerebrated dog, which were known to all students of neurology 30 years ago, have been newly investigated by Cannon[13] and his pupils, who describe in decorticated animals an quasi-emotional (pseud-affective) state, designated "sham rage," the hypothalamic source of which Bard[14] subsequently succeeded in delimiting.[15] Since this state is accompanied by the same increase in blood-sugar, elevation of blood pressure, sweating, and outpouring of adrenalin, it is evident that the region lies in direct connexion with the spinal ganglia of the sympathetic nervous system. And recently Beattie and his co-workers[16] in their study of experimental cardiac arrythmias have furnished anatomical proof of this connexion by actually tracing the degenerations that follow experimental subthalamic injuries of the posterior part of the third ventricle. There is much more of this that might be told, but enough has been said to indicate what a promising field of experimentation has been opened up by these successive disclosures that serve closely to relate the diencephalon to metabolic processes, to the primary emotions, and, lastly, to the sympathetic nervous system.

With this mention of what may be regarded as a higher vasomotor centre in the posterior hypothalamus whence non-medullated fibres descend in the spinal cord to be distributed to the viscera, it would appear that we are now getting far removed from any possible participation of the hypophysis in this mechanism—yet we may not be so sure of this. It was shown by W. E. Dandy in my laboratory in Baltimore many years ago[17] that sympathetic fibres spreading from the carotid plexus could be stained by intravital methods and traced along the vessels of the stalk to the anterior hypophysis.[18] It was on this basis that the subsequent study, to which allusion has already been made, was undertaken with Weed and Jacobson, in the attempt to determine whether the autonomic fibres in question could be experimentally shown to have an effect on the pituitary body. We had observed that in dogs a puncture of the third ventricle

[12] Cf. Greving, R.: Die zentralen Anteile des vegitativen Nervensystems, Handbuch d. mik. Anat. d. Menschen, Bd. iv., Berlin, 1928, Fig. 120, p. 1043.

[13] Cf. Cannon, W. B.: Neural Organization for Emotional Expressions, Chap. 22, in "Feelings and Emotions," Clark University Publications, Worcester, Mass., 1928, p. 257.

[14] Amer. Jour. Physiol., 1928, lxxxiv., 490.

[15] Fulton and Ingraham (Proc. Physiol. Soc., April 27th, 1929, Jour. Physiol., 67) have produced a similar though chronic state of sympathetic hyperactivity by operative severance of the cerebral connexions of the hypothalamus.

[16] Proc. Roy. Soc. B., 1930, cvi., 253.

[17] Amer. Jour. Anat., 1913, xv., 333.

[18] Cowdry, E. V. (1930), has recently demonstrated in contact with the cells of this part of the gland the internal reticular apparatus of Golgi.

in the region of the hypophysis was almost as certain to produce glycosuria as a Bernard piqûre. Having then no reliable method of testing blood-sugar, we relied solely upon demonstrable glycosuria and soon found that in the same animal a succession of lesions (a fourth ventricle puncture, transection of the spinal cord at the fourth thoracic segment, stimulation of the superior cervical ganglion, and stimulation of the exposed hypophysis) could provoke an outpouring of sugar provided sufficient time was allowed between sessions for a reaccumulation of available glycogen.

These experiments doubtless are capable of reinterpretation in the light of new knowledge, but the point I wish here to emphasise in again mentioning them is that Bernard's piqûre may possibly cause glycosuria by injuring the descending hypothalamic bundles which lie superficially placed in the midline of the roof of the fourth ventricle. This, however, is not the only effect that lesions of this important tract may produce. Median cerebellar tumours that arise from the roof of the fourth ventricle are of common occurrence, and of late years, particularly since the advent of electro-surgical devices, they have come in large numbers to be radically attacked and removed. In this process the entire floor of the widely dilated ventricle is laid bare to view with the likelihood of its being subjected to trauma.

For reasons heretofore mentioned, a post-operative glycosuria is rarely observed after these surgical exposures of the fourth ventricle, though a post-operative hyperthermia, as already stated, is a not uncommon sequel. And while on this particular subject there is still another matter to which attention may properly be called. Three fatalities from acute perforations (one gastric and multiple, one duodenal and double, and a third œsophageal) have followed radical extirpations of cerebellar tumours, in two of them the fourth ventricle having been widely opened. The only possible explanation of these disconcerting accidents—and similar observations have been reported in medical literature—is that something injurious has happened to the nervous mechanism which in some way protects the gastric mucosa from auto-digestion. It is well known that most patients with peptic ulcer have an antecedent history of worry or apprehension associated with mental strain or fatigue, episodes of this kind being the usual preliminaries to recurrence of symptoms after their temporary recession; and I have been struck by the frequency with which patients with intracranial and particularly with third ventricle tumours have previously or subsequently had symptoms suggestive of gastric or duodenal ulcer.

All this concerning a diencephalo-sympathetic mechanism, which harks back to the early postulation by Kredel and Karplus of a cerebral representation for the sympathetic system, would appear to be remote from any conceivable bearing on the pituitary body. However, the fact emphasised by Raab, in his studies of fat metabolism that posterior lobe extract is particularly effective when injected into the ventricle, has led us to administer the extract in this way in a number of patients with pronounced hypopituitary states. They had all been previously operated upon for pituitary adenomas, and the injection was easily made through one of the burr openings for the craniotomy. We anticipated that there would be a rise in basal metabolic rate, in body temperature, and in blood pressure, possibly also a temporary hyperglycæmia; but quite the reverse happened.

The reaction has not been marked in all instances but when marked, almost immediately, and certainly before the extract could reach the blood stream, the patient flushes, breaks out into a drenching sweat, the blood pressure sinks, and the temperature falls. In one individual the rectal temperature dropped so low it could not be registered for several hours with a clinical thermometer, and two days later the observation was repeated with the record taken on a kymographic thermo-couple. The pre-injection rectal temperature of 98·8° dropped in the course of two hours to 93·8°, where it remained stationary for nearly two hours, and then slowly returned to normal. The basal metabolic rate meanwhile fell from its pre-injection level of −27 to −50 when the temperature was at its lowest, and had only risen to −37 at the end of four hours.[19] When given subcutaneously in this patient the extract had no appreciable effect except as an antidiuretic. When given intravenously, as a control, it caused immediate pallor with no sweating and acted as a prompt purge; but the antipyretic response and effect on the metabolic rate was negligible. Corresponding reactions, though less marked, have been observed in other patients.

However these effects are to be interpreted, they at least indicate that we cannot safely ignore the possibility of some posterior lobe participation in the vasomotor and other activities of the interbrain. Whether there are other drugs that would act by way of the ventricle in this same vigorous way with the same promptitude is not known, but certainly the extract when so administered must act on the hypothalamic centres by direct absorption rather than by finding its way first into the blood stream, else, when injected intravenously, it would be expected to produce the same reactions with equal or greater promptitude.

But even should the "hypothalamists" grant that the posterior lobe way well enough be under the influence of the diencephalon now that the two have been shown to have histologically demonstrable neural connexions, they would still exempt the anterior hypophysis from any such control. As already pointed out, even the gonadal aspects of the adiposo-genital syndrome have been ascribed by them to hypothalamic injuries, and Smith, too, has included (1927) genital atrophy among the characterising features of the tuberal syndrome in the rat, leaving for the anterior hypophysis only the control of growth and the influence on thyroid and adrenal cortex. In all probability this gonadal effect is merely another instance of interference with hypophysial blood-supply, or of interrupted nerve-supply. Otherwise we could not possibly explain why precisely the same gonadal effects, produced by experimental ablations of the anterior lobe, can be effectively counteracted so long as replacement therapy is continued.[20] Moreover, the attribution to the tuber of an independent influence on the reproductive functions would appear to disregard the proven relation of the anterior lobe to these processes through a special hormone.

In short, it is highly improbable that these two corresponding effects should be produced, the one by an hypothalamic lesion, the other by removing the source of chemical messages, in the absence of any functional interaction. Though both are instances of deprivation effects, one paralytic, the other secretory, some light may be shed on the subject by recent observations, dealing with the activation rather than the inhibition of this particular neuro-

[19] A cubic centimetre of "surgical pituitrin" has been used in these tests.

[20] Smith, P. E.: Hypophysectomy and a Replacement Therapy, Amer. Jour. Anat., 1930, xlv., 205.

genital mechanism. To this purpose the rabbit lends itself particularly well, for, unlike rats and mice, it is a peculiarity of this animal normally to ovulate only after mating. The actual discharge of the ovum occurs after a lapse of 10 to 12 hours, this, as shown by Corner, being approximately the length of time it takes for ovulation to be artificially induced by the injection of the chemically isolated anterior-pituitary hormone of sex. To supplement this, Fee and Parks [21] have found that if the animal is decerebrated with inclusion of the hypophysis within an hour after mating the cycle will be interrupted, whereas if the decerebration is delayed for more than an hour, the normal process of ovulation will go on to completion. From this it is quite apparent that the copulatory act must set going some emotional and excitatory impulses which serve with promptitude to release the sex hormone from the anterior hypophysis. These impulses, arising in this way, could scarcely be discharged other than from that primitive structure, the interbrain, common to all mating species, and they either pass directly to the gland or, what is more likely, reach it in a more roundabout way through the sympathetic nervous system. Zondek speaks of the pituitary sex hormone as the motor that sets the reproductive cycle going, but the emotional self-starter is probably in the diencephalon.

Clinical Correlations.

We have so far, largely from an anatomical and physiological point of view, considered more or less separately the anterior pituitary, which is typically a gland of internal secretion, the infundibular lobe with its epithelial investment which has a secretory mechanism dissimilar from any other in the body, and finally the diencephalon, an all-important station for the transmission or possibly for the inauguration of vegetative and emotional mesages. And while discussing these separate parts stress has been laid, so far as possible, on their interdependence.

Though in modern times attention was redirected to this region of the wondeful rete by its tumours, our principal source of knowledge has been, as usual, the experimental laboratory where there are now so many interested workers, ably abetted be it said by the dog, the rat, the ox, and the pollywog, scarcely a day passes without some new disclosures. These may be in harmony or in discord with established views, and to correlate with clinical experience what knowledge the laboratory provides is often difficult, even baffling. This may be for want of that peculiar acumen or instinct that tells what at the bedside is worth recording, but it is partly due to the adaptability of the body to its pathological processes which may so effectually hide their symptomatic effects as to render them scarcely possible to detect. Endocrinology lends itself to two glaring faults, one the popularisation of writing on the subject, and the other a tendency of clinical observers to draw upon their fancy in a symptomatology which does not lend itself to precision.

The first thing with which one is forcibly struck in clinic and pathological laboratory is the frequency with which lesions that supposedly would throw the diencephalo-hypophysial mechanism wholly out of function may give, at least in the present state of our perception, no appreciable symptoms whatsoever. It is well known, for example, that in hydrocephalus the walls of the third ventricle become ballooned out to paper thinness and apart from the clinical tradition that hydrocephalic children are apt to be placed, good natured and well nourished, the 'tween brain appears to be doing its work well enough.

Even more striking is the fact that large tumours may come to fill the third ventricle, and so to distort its walls as to leave no recognisable trace of them, without the slightest symptomatic indication of any interference with the neurohypophysial mechanisms which have been so laboriously analysed. Should one wish to present further evidence that all of this talk about the hypothalamus and its functional importance is mere rubbish, the fact may be adduced that tumours of the third ventricle are far more often betrayed by ventriculography than by the neurological symptoms they provoke; and to make this still more emphatic, the further fact may be dragged in that under favourable circumstances tumours of this region may be successfully removed without provoking any of the symptoms heretofore discussed at such length. In two recent cases, by a transcortical approach through a hydrocephalic lateral ventricle a roentgenographically-demonstrated ependymoma filling the expanded third ventricle has, with much trepidation, I admit, been radically dissected out of its bed leaving a large, raw cavity with no subsequent trace of personality change, of polyuria, adiposity, somnolence, hyperthermia or vasomotor disturbance, one or all of which might well enough have been expected.

But negative observations such as these, however, disconcerting, need not be given undue weight. Positive findings when suitably marshalled are more important than any number of circumstantially negative ones; and when cases come to be analysed in sufficient numbers, there is found to be convincing testimony in abundance. There are two types of tumour of the region which from a symptomatic standpoint are particularly informative. They are the chiasmal gliomas and the congenital tumours of the hypophysial duct to which frequent allusion has already been made.

THE CHIASMAL GLIOMAS.

These tumours, though less common than the craniopharyngiomas, provide an important contrast not only in that they are invasive and destructive but because they primarily involve the region of the supraoptic nucleus, whereas the congenital tumours produce their effects by pressure distortion and are more likely to implicate the hypophysis and the tuberal region.

A report upon these chiasmal gliomas, largely from an ophthalmological standpoint, was made in 1923 in collaboration with Dr. Paul Martin, at which time we had little to say of their tendency to invade the ventricle. In this respect to be sure the tumours differ greatly, for some of them are relatively benign types of glioma which fail to provoke recognisable diencephalic symptoms, whereas others of a more malignant type soon involve the anterior wall of the ventricle, and may in time wholly obliterate its cavity.

When one comes to review the clinical histories of the 22 cases in which such a tumour has been histologically verified, it is not surprising that the older records are found wanting in respect to some of the points on which greater emphasis might be laid to-day, rapid loss of sight having been the urgent symptom to which chief attention was naturally paid. Nevertheless, polyuria was observed in nine instances (six of them being recorded as diabetes insipidus with a daily output of *circa* five litres), and in only four cases was it expressly stated that there was no

[21] Studies on Ovulation, Jour. Physiol., 1929, lxvii., 383.

polyuria. Adiposity was noted (or the photographs of the patients indicate its presence) in eight instances, and in three there was notable obesity. Though one of the obese patients showed excessive polyuria, most of those with pronounced diabetes were, on the contrary, thin and tall; one of them, a recently observed case, was a spare young man, aged 23, six feet three inches in height, with marked diabetes of over three years' duration. In another instance, a boy 13 years of age with marked diabetes, the emaciation had become extreme.

Undue sleepiness, occasionally described as somnolence, was mentioned in six instances. The systolic blood pressure was 110 or below in the majority of the cases, the basal metabolic rate was subnormal in the nine patients on whom it could be taken, and the five early postoperative fatalities were all attributable to, or at least associated with, extreme terminal hyperpyrexia.

Occasionally one of these gliomatous tumours may evoke a definite "march" of symptoms which suggests a progressive involvement of the diencephalic centres. Of this the following is an example:

A previously healthy pre-adolescent school girl resident in New York, an only child, 13 years of age, in October, 1929, acquired an oculomotor palsy on the right eye and soon after was found to be blind in that eye. She was taken to a hospital, where on X ray evidence the diagnosis of a suprasellar tumour was made. Questioning brought out the fact that antecedent symptoms of polydipsia and polyuria had long been present; that during the summer of 1929 she had suddenly grown quite stout (her exact weight had not been taken); and that she had been withdrawn from school that autumn because of abnormal sleepiness (12 to 16 hours a day). Vision shortly after became impaired in the other eye, and soon the child showed a marked change in personality. It was difficult to induce her to take nourishment, she became uncontrollable, and soon acquired an unaccountable fever ranging from 101° to 104° F. which persisted for ten weeks up to the time of her admission to the Brigham Hospital.

On admission (Jan. 25th, 1930) the child proved to be more like a wild animal than a human being. She would lie quiet and apparently somnolent unless approached or touched when, as Dr. Oldberg's record expresses it, "she would become suddenly galvanised into tremendous hyperactivity." She would utter a succession of piercing shrieks, would thrash violently about the bed, meanwhile clawing and scratching at her attendants. Most of the time she was wholly irrational and incontinent and only after prolonged coaxing could she be persuaded to take food or drink. She was found to have: (1) a primary optic atrophy with apparent blindness; (2) a normal sella turcica without suprasellar calcification; (3) a persistent pyrexia without accompanying leucocytosis; (4) a pulse-rate of *circa* 140 with arrhythmia; and (5) an oliguria rather than a polyuria, so far as could be determined. There certainly was no polydipsia.

The child remained in this hopeless state with conditions unaltered for the next three weeks. An exploration offered little but was finally undertaken on Feb. 18th, when a soft glioblastoma of malignant type involving the chiasm and spreading widely into the ventricle was disclosed. A considerable mass of this tumour was sucked out and radium seeds implanted. There was subsequent hyperthermia and she died 48 hours later with a rectal temperature of 108°.

Here, then, was a case in which disturbance of water and fat metabolism, of thermal regulation, of sleep, and possibly of the vasomotor mechanism were finally all obscured by the removal of cortical inhibitions which left the patient in a state quite comparable to the "sham rage" described by Cannon and others in decorticated animals. All these symptoms, it will be observed, may well enough be looked upon as purely diencephalic in origin, with no obvious bearing on the pituitary body whatsoever. As a matter of fact, since three out of every four of the recorded chiasmal gliomas occur in childhood, since many of them pursue a rapid course, and since the hypophysis does not become directly involved in the process, secondary disturbances of growth and maturation are inconspicuous or wholly absent from the clinical picture.

THE CRANIOPHARYNGIOMAS.

In contrast to the foregoing, the symptomatic sequence in the congenital hypophysial-duct tumours is more slowly progressive. The effect of the lesion upon the secretory activity of the anterior hypophysis is ordinarily evident from the outset, and owing to the usual point of origin of the lesions they come to exert their pressure effects against stalk, infundibulum, tuber, and chiasm from behind and below rather than from in front as do the invasive gliomas just considered.

A systematic review of 80 of these cases that have been histologically verified, however disheartening from a neurosurgical standpoint, for they represent one of the most baffling of neurosurgical problems, yet provides a fruitful source of study of diencephalo-hypophysial symptomatology. As already mentioned, these tumours vary greatly in position, size, distribution, histological character, age of symptomatic onset, and ultimate complications. They may be minute, pea-sized cysts, or huge, calcareous masses the size of a tennis ball; they may originate and remain confined within the sella or, what is more common, lie wholly above it and consequently they are, most of them, lesions that compress the tuber and hypophysial stalk early in their course.

Two of the constitutional features characterising the syndrome of Fröhlich—namely, the retardation of growth and adolescence—are sufficiently well explained in the young patients by the interference, through compression, with the normal secretory activities of the anterior hypophysis. An explanation of the adiposity is less clear, and the fact that it often occurs in the absence of polyuria shows that these two symptoms do not necessarily go hand in hand. Indeed, patients with a tumour confined within the sella, as is true of the adenomas, often show adiposity when the tuber could hardly have been affected.

The age-distribution of these cases at the time of their hospital admission has been by decades as follows: 15 in the first; 27 in the second; 15 in the third; 10 in the fourth; 7 in the fifth; 4 in the sixth; and 2 in the seventh decade. By far the more striking symptoms occur in the younger groups, in which evidence of anterior lobe impairment is shown by delayed growth or actual dwarfism and by retarded maturity or persistence of actual infantilism. Most of these younger patients at the same time show a tendency to be over well nourished, or they may be actually obese. This, however, is not invariable, for some of them are actually thin or emaciated; and others become definitely progeric in appearance, suggesting the gradually developing cachexia observed by Smith in his hypophysectomised rats.

Some of these purely anterior lobe symptoms may be carried over from early life to the third decade, but this is unusual, for the almost inevitable secondary complication of hydrocephalus ordinarily serves to end the story before this. When, on the other hand, symptomatic evidence of the lesion, usually signalised by a disturbance of sight, is postponed to the third decade or later, growth and development may have been normal in all respects. Amenorrhœa, or, in the male, sexual dystrophy, then usually puts in an appearance, but under certain circumstances depending on the site of the lesion even these indications of anterior lobe involvement may be wanting. Our most recent case provides, through a sorry experience, an example of this.

A woman 27 years of age (Surgical No. 35994), having previously enjoyed normal health, was married in January, 1925, and soon became pregnant. At the time of parturition expulsion was impossible, and after a prolonged labour recourse was had to a forceps delivery which the child did not survive. In spite of no nursing, she continued to lactate for twelve months. Three years later, at her second pregnancy, precisely the same sequence of events occurred. Following this, she became hypersomnolent and showed marked mental changes accompanied by periods of fright that were regarded for some months as a post-partum psychosis until the presence of a frontal tumour was finally suspected.

On admission to the hospital she was found to have a choked disc of six diopters associated with suprasellar calcification and secondary hydrocephalus, possibly accounting in part for her mental changes. Perimetry was precluded; also the metabolism estimation. Her temperature was subnormal, registering 96° F. on one occasion. The blood pressure was exceedingly low, 80 systolic over 40 diastolic. Her skin showed a blotchy pigmentation. There was no adiposity or polyuria.

At the operation a subchiasmal tumour was disclosed and in the hope of thereby relieving the hydrocephalus its calcified portion was dislodged and an overlying cyst emptied. From this operation she never regained consciousness and died 24 hours later, apparently from cardiac complications without hyperthermia. A comparatively small cystic tumour, chiefly involving the tubero-infundibular region with intact pituitary body and stalk, was found at autopsy.

Here, then, is an example of a craniopharyngioma situated in the tuberal region that had given no symptoms of any sort till the third decade and even then none that could be ascribed either to diencephalon or to hypophysis, unless possibly the repeated difficulties of parturition can be ascribed to imperfect uterine contractions from want of posterior lobe secretion. As an offset to this case, one in which pronounced diencephalo-hypophysial symptoms first put in their appearance even later in life may be cited:

The patient, 46 years of age, a classical scholar holding a professorial chair, had always enjoyed excellent health, had been married for fifteen years, and was the father of three children whose ages were 14, 11, and 8 years respectively. His height was 5 ft. 9 in.; his average weight had long been stationary at about 182 lb.

Some six months or so before his hospital admission (viz., Oct. 3rd, 1928) he began to experience a subjective blurring of vision. Soon after this, in uncertain sequence, he became impotent, extremely drowsy, acquired an abnormal thirst with evident polyuria, and definite personality changes were soon observed.

Examination.—The patient was quite indifferent to his breakdown, bored by the neurological tests and note-taking, and though polite and serene if aroused, if left alone tended to drop off to sleep. He was occasionally incontinent and was once found in bed between the sheets with his boots on, fully dressed. The fundi were regarded as normal in spite of the presence of a large central scotoma in the left eye and a lower temporal defect on the right. There was unquestionable diabetes insipidus, his polyuria averaging from four to five litres daily. He was, perhaps, over well nourished but not more so than might have been expected of a man of his age accustomed to a sedentary life. The basal metabolic rate was −32 per cent. The sella turcica was of normal size and contour. The examination otherwise was quite negative and ventriculograms were interpreted as showing normal conditions.

The patient remained under observation for a month with the nature of his lesion undiagnosed, and as he was evidently deteriorating a transfrontal exploration was finally made on the assumption that a suprasellar tumour of some sort must be present. A solid craniopharyngioma was disclosed (on Nov. 5th, 1928) largely underlying the chiasm, which was pushed upward. The better to expose the lesion, the chiasm was split anteroposteriorly whereby the anterior third ventricle and supraoptic nucleus could scarcely have escaped injury.

From this operation the patient made an excellent recovery with improved visual acuity in spite of the permanent bitemporal hemianopsia to which he was committed. Instead of there being an increase in the polyuria it definitely and progressively diminished, and at the time of the patient's discharge (Nov. 26th, 1928), three weeks later, the intake and output had dropped to about 1500 c.cm. daily. Meanwhile, instead of gaining weight he had lost, from 191 to 175 lb.

He subsequently attempted to resume his college duties but it was too much for him and he spent most of his time in sleep during the winter and spring, there being occasional periods of transient polydipsia but no gain in weight. During the summer he was much better, quite like himself for the first time since the onset of his malady, but by the end of September he had again become so somnolent he would sleep 20 hours out of the 24. A month later pressure symptoms set in, with headache, vomiting, rigidities, Cheyne-Stokes respiration, slowed pulse, and on Nov. 26th, 1929, came the end, scarcely more than 18 months from the first observed symptom.

The emotional negativism shown by this man is highly characteristic of these particular lesions and stands in marked contrast to the violent psychomotor agitation ("sham rage") in the patient with a glioma previously described. Between the negative and positive emotionalism shown by these extreme types there are countless gradations that have long excited the interest of neurologists and psychiatrists.

The tumour in this particular case, a non-calcified though largely solid type of craniopharyngioma, not only filled the entire interpeduncular space, but projected into without enlarging the sella turcica, the pituitary body having become greatly compressed. The notable symptoms were impotence together with diabetes insipidus and moderate adiposity, both of the latter subsiding as the malady progressed, an increasing somnolence being the major terminal symptom. Tumours fully as large as this, however, may cause scarcely any appreciable symptoms and would remain practically silent were it not for the customary disturbance of vision from involvement of the chiasm and the terminal manifestation of hydrocephalus.

It would be superfluous to cite further clinical examples of diencephalo-hypophysial symptomatology. These few may well suffice. Here in this well-concealed spot, almost to be covered by a thumb-nail, lies the very mainspring of primitive existence—vegetative, emotional, reproductive—on which, with more or less success, man, chiefly, has come to superimpose a cortex of inhibitions. The symptoms arising from disturbances of this ancestral apparatus are beginning to stand out in their true significance. That the older literature proves to be filled with reports of cases as telling as any of those that I have cited goes to show that we have advanced no whit in powers of observation, merely that modern science has permitted us to give to them revised interpretations.

Final Argument.

There is indeed nothing wholly new under the sun; what appears to be new is no more than something old in a novel aspect. In support of this, and before attempting to assemble the arguments favouring the interdependence of diencephalon and pituitary body, I may be permitted a quotation from the writings of one of your countrymen, a seventeenth century physician and anatomist:[22]

"Seeing therefore there is such an affinity as before mention'd, between the *Rete Mirabile* and *Glandula Pituitaria*, and taking it for granted, that the office of the *Glandula Pituitaria* is not what it hath generally hitherto been believ'd, to the end we may attain a more exact knowledge of what it really is; it seemeth not altogether immethodical to take that part into consideration in the next place, together with the *Infundibulum*, which last hath not only as near a relation to the Gland as the Gland hath to the *Rete*, but such a close communication with it, that *it seems in a manner almost impossible to treat of one independently of the other.*"

The italics are mine, but the conception that pituitary gland and adjacent third ventricle can scarcely be considered separately is far from being so; and it may not be "altogether immethodical" in

[22] Ridley, H.: Anatomy of the Brain, London, 1695.

closing this address to supplement the statement made by Humphrey Ridley over two centuries ago by newly acquired, though at times somewhat contradictory, testimony, derived at many hands from diverse sources—evolutional, morphological, biological, pathological, and clinical.

The pituitary body is a combined neuro-epithelial organ present in all craniates. Its purely epithelial lobe is the first of the endocrine organs to be differentiated in the embryo; its neural portion is an outgrowth of the oldest part of the brain to be laid down. If the rudimentary organ is removed from the amphibian embryo its further growth and metamorphosis are promptly checked; if reimplanted, these effects do not occur, but the rudiment will not long remain functionally active unless neural tissue is included in the transplant. The infundibular lobe is an expansion of that ancient portion of the cerebrum, the diencephalon, which retains its simple structure in all creatures that can boast of a brain at all. Herein lie ancestrally important mechanisms common to all species which have to do not only with their vegetative functions, but with their primitive instincts—in mating, in satisfying hunger and thirst, in restoration from fatigue by sleep, in regulation of body temperature, in self-protection by combat or escape. From the diencephalon non-medullated nerve-fibres pass direct by way of the infundibulum to be distributed in the posterior lobe and its epithelial envelope. Extracts of this lobe contain a peculiarly active substance or substances, the injection of which serves to counteract one, at least, and probably more than one of the symptomatic effects of irritative or paralytic injuries to the suprajacent interbrain. Non-medullated nerve-fibres also connect this ancient station by way of the spinal cord and the sympathetic nervous system not only with the thoracic and abdominal viscera but some of them even turn back to act upon the anterior hypophysia itself. Hence diencephalic messages may be relayed to this somewhat insulated part of the gland on whose hormones depend not only normal body growth and the normal function of certain subsidiary endocrine organs but, indeed, the very perpetuation of the species. For without the presumably emotional discharge from this source of the hormone of sex, the chain of events leading to the escape, fertilisation, and implantation of the ovum cannot take place.

Though information may be gained by the independent study of its separate parts, physiologically the diencephalo-hypophysial mechanism can only be properly interpreted when looked upon as a whole and even then only when its influence on the entire organism is taken into account. So, at the end, I may appropriately quote what Thomas Willis said of that "divine artifice," the *Rete mirabile* and its function: "There is nothing in the whole fabric of an animal body more worthy of admiration . . . . nothing can be conceived as more skilful, and nothing which argues more forcefully the providence of a divine Author."

Corrigendum.—On p. 125 of THE LANCET last week in the footnote (No. 13) the names of Prof. G. Popa and Dr. Una Fielding were mis-spelt.

THE HOSPITAL SHOPPING BUREAU.—This organisation, which was established by the British Charities Association to assist the smaller hospitals to buy on the best terms possible, is to be shut down. It was pointed out by the National Chamber of Trades that the scheme was prejudicial to local retail traders who are constant in their support of the hospitals.

THE USE OF AVERTIN IN CHILDBIRTH.

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THE use of anæsthetics and analgesics in labour has been for long a matter of much argument, beginning on the day when Sir James Simpson courageously and dramatically eased the pains of labour for a royal patient. No humane practitioner would take the negative side if the means were to his hand, but hitherto the adverse arguments have held the field, mainly because of the absence of such means. At the present time, when much attention is focused on the history and development of midwifery, it has been shown that we cannot congratulate ourselves on its progress when compared with the sister arts, Medicine and Surgery. The reasons are not far to seek. First comes the inertia and conservatism associated with a fatalistic agreement that "man is born to trouble as the sparks fly upward." In this case it is *woman*, and since, till comparatively recent years, women's knowledge of the sciences and arts associated with medicine have been negligible, womankind has had to suffer in travail unassisted, except by the encouragement of the tender-hearted but non-understanding medical man, and the knowledge that the pain will not last for ever. Secondly, there is the fact that midwifery is very poorly paid. The result is that the older and more experienced practitioner tends to avoid it as much as possible, leaving the bulk of it to his junior, with his way to make and his experience to gain. Apart from the pain, which has been well described as "devastating," in the majority of cases of childbirth the course is physiological, and the larger number of patients will not and frequently cannot pay a fee at all commensurate with the care and anxiety required to make sure of a successful termination to labour. But the third and most important reason is connected with just that humanity and pity which is common among the medical profession. The cries of the patient, the trepidation of the husband, and the urgency of the woman's mother combine to urge the doctor to *hurry*, with many and various regretful sequelæ. The first two reasons will remain, I fear, for some time, but the third may be removed.

Apart from the actual difficulties of labour, there are associated questions which may be influenced by the administration of something to ease the pains. I believe that the results of the normally "devastating" pain of a first labour are far reaching. They include the wish to avoid further pregnancies, thus destroying the perfection of marital relations. They encourage the resort to various noxious or mechanically harmful contraceptives; and they frequently lead to the use of abortifacients, with their far-reaching pathological effects. In the end they lead to an unstable and anxious mentality which is very common in the ranks of those wives who have ambition to make something out of life higher than merely existing from day to day. Such observations were very impressive during five and a half years while I was in charge of a large gynæcological and obstetric department in a poor-law hospital, to which many of such cases eventually came.

The Available Agents Reviewed.

I am convinced that any agent which would remove or mitigate such memories of the first labour would also remove or mitigate some of these distressing

results. No such agent is worth anything unless it can be used by the general practitioner. Midwifery is, and will be, in his hands for some time to come. In hospital practice, and in well-paid nursing home practice, various means are at the disposal of the specialist. Scopolamine and morphine, or intermittent gas and oxygen, can be used with quite good results. But the former entails many visits to the bedside, and the latter may mean a sederunt of 8 to 12 hours—both quite impracticable for the general practitioner. The use of rectal ether has been associated with so much well-grounded adverse fulfilled the requirements outlined above in a marked degree. Most of the work, both abroad and by myself, has been in hospital practice, but enough has been done in private to establish the usefulness of the drug.

Indications.

Avertin may be used in every case where the antenatal examination has given expectation of normal parturition, except if the presenting part is on, and stretching, the perineum. In such cases whiffs of chloroform are indicated. In abnormal cases, such as malpresentations, the abnormality, of course, has

TABLE OF TYPICAL CASES OF CHILDBIRTH WITH AVERTIN.

No.	Age.	Labour commenced.	Two-thirds dilatation. Avertin given.	Drowsy in minutes.	Pulse—		B.P.		Child born.	Parity.	Reaction of mother.	Condition of child.	Intervals of contractions in minutes.	Milk.
					Before.	After.	Before.	After.						
1	28	7·45 a.	10·15 p.	8	102	90	140 80	130 90	11·5 p.	4th.	Avertin given too late. Wakes for pains.	Normal. Strong cry.	10–4	Good.
2	16	—	4·45 p. 5·15 p.	15	80	92	140 110	120 90	6·7 p.	1st.	Restless. Wakes for pains.	No effect.	5	,,
3	28	2 a.	5·45 p.	7	96	86	130 100	130 90	8·50 p.	,,	Wakes for pains.	Strong cry at once.	5–6	,,
4	19	—	2·45 a.	10	88	90	130 75	100 75	4·0 a.	,,	Unconscious during pains. Restless, needs slight restraint.	Cried at once.	4	,,
5	19	—	8·10 a.	8	84	80	125 70	100 70	11·15 a.	,,	Rouses during pains. Restless.	Strong cry.	10–3	,,
6	22	2 p.	3·50 p. 4·30 p.	10	100	104	160 100	150 110	6·55 p.	,,	Felt last 3 or 4 pains only.	Cried at once.	4	,,
7	32	—	10·50 p.	10	90	92	130 90	85 50	1·0 a.	,,	Unconscious between pains. "Felt nothing." Forceps applied for delay on perineum.	Slight apnœa.	5	,,
8	31	1·30 a.	9·0 a. 10·15 a.	—	—	—	—	—	11·15 a.	2nd	Drowsy, but felt pains slightly.	Slight asphyxia.	6	Fair.
9	27	—	8·30 p.	5	—	—	—	—	9·50 p.	1st.	Drowsy, felt nothing.	Normal.	—	Good.
10	24	3 a.	9·15 a.	6	96	100	140 100	135 100	5·45 p.	3rd.	Drowsy and painless for 4 hours. Slight pain for 2 hours.	Strong cry at once.	3–8	,,

a. and p. = a.m. and p.m.

Notes of Cases.—CASE 6. Albuminuria with marked œdema. CASE 7. Very long first stage—over 24 hours. Patient had morphia twice. CASE 8. Version under general anæsthetic, with induction of labour, for breech presentation with contracted pelvis. Prolonged first and second stages. CASE 10. Albuminuria. Long second stage. Action of avertin lasted for six hours, but thereafter patient fully conscious of contractions and pain. Dose should have been repeated. Child showed no effects.

criticism that I have never tried it. Of course chloroform has remained the standby, but here again the practitioner must be present the whole time, and take the chances of chloroform poisoning, or confine its exhibition to the last few pains, which is not by any means enough to attain the end in view.

The introduction of avertin seems to give hope that at last we have something that fulfils the requirements. These are: (1) Safety. (2) Ease of administration. (3) Effective mitigation of pain for a sufficient period. (4) Absence of after-results to either mother or child. (5) Absence of undue prolongation of labour. (6) Portability. Avertin was introduced on the Continent, and I know of no literature in this country dealing with its use in labour. Like all such novelties, it had to find its place as regards indications, dosage, &c. The German literature, however, was so convincing that I experimented, and although even now I have only used it in a few more than 50 cases, in these it has to be rectified, but unless definite operative measures have to be instituted, requiring a deep anæsthesia with great relaxation, avertin is useful in allowing time for the natural forces to come into play, for example in slowly rotating posterior presentations or in the operation of version and bringing down a leg. A marked disproportion between the head and the pelvis is probably an indication for Cæsarean section, but if this is contra-indicated, here again avertin will allow time for the cervix to dilate fully, and for as much moulding to take place as possible, before attempts are made to deliver, whether after perforation or not.

It is in primiparæ that the greatest use of avertin is found. All multiparæ will agree that the first was infinitely worse than subsequent labours. I was at first frequently too late in administering the injection to multiparæ. Once full dilatation is reached in them, and the waters have broken, the head frequently comes on to the perineum at once, and makes the injection difficult or impossible. A rather different

time of administration must, therefore, be chosen in treating primiparæ and multiparæ.

A Typical Case.

The course of a typical case of avertin anæsthesia in a normal primipara is as follows.

The patient commences labour and either goes into hospital or nursing home, or sends for the doctor and midwife. As soon as a show or one finger dilatation of the os, with good regular contractions, has established the diagnosis, a quarter grain of morphia is given. Less morphia should not be given, as in some cases it has only the effect of increasing the excitement and distress of the patient, and strengthening the contractions. In a few cases another sixth of morphia is required, especially in primiparæ over 30, but commonly the effect lasts until a quiet dilatation has taken place in 6 to 12 hours. Occasional examination per rectum will give an indication of progress, but these are mostly unnecessary. Membranes of a normal toughness with a well-fitting head will not rupture until the os is about two-thirds dilated and on this rupture the doctor should again be called. At this point also the patient begins second stage pains, bearing down and complaining of severe backache. This is the time to give the avertin, and not before. The patient should be allowed to realise the severe pain that accompanies the descent of the head, in order that she may more fully appreciate the benefit of the comparative ease thereafter. With multiparæ, the optimum time for giving the avertin is less exact. It is better to anticipate the rupture of the membranes. In many cases there will not be time to give the preliminary morphia, and it is less necessary here. Avertin should be given when the cervix is fully half dilated, if the contractions are strong and regular. If they are not it is as well to wait until they are—probably another hour or so. The patient is then left to herself, the doctor having satisfied himself during half an hour that the pulse-rate, the respiration-rate, and, if he likes, the blood pressure are in good order. The administration of avertin may be accompanied by a short period of excitement if, in multiparæ, a previous injection of morphia has not been given. But this does not last more than five to ten minutes, and is usually entirely absent after morphia. The patient is asleep within five minutes in the majority of cases, although she may be roused to speak.

It is generally recognised that morphia should not be administered within two hours of the birth of the child, and avertin should not be given until two hours have elapsed after the morphia. The action of morphia in childbirth is very variable, but the usual slow dilatation in primiparæ gives ample time for such intervals to be attained. The rare case of precipitate labour in a primipara is easily recognised by the early prolonged and powerful contractions, and by the fact that the cervix is much further dilated than usual when first the doctor sees the case. It would then be treated like a multipara and the morphia omitted.

It is obviously of benefit to carry out all subsequent procedures quietly and gently. In nervous and excitable people full sleep may not ensue for 10 to 20 minutes. In certain cases in hospital and most cases in private, I have returned shortly before the "crowning" of the head, to give either a few drops of ether, or gas and oxygen, in order that the patient may have no recollection whatever of the birth of her child. In primiparæ this is useful, but in multiparæ quite unnecessary. If it is omitted, however, and the effect of the avertin is diminishing, the patient may become very restless and even uncontrolled during the passage of the head over the perineum. This has in a few cases made it difficult to "support the perineum" (a process which I consider really useless).

Technique.

The technique is simple. The apparatus required consists of: (1) a graduated glass cylinder to hold about 300 c.cm., with cork for same; (2) a small measure, say 10 c.cm.; (3) a funnel with tubing about three feet, ending in a glass connexion to join with (4) a No. 6 catheter; (5) a thermometer, F.; (6) a small bottle of 1–1000 Congo red solution; (7) a bottle of distilled water, say 1000 c.cm.; (8) avertin fluid.

The preparation of the injection is as follows:—

Into graduated measure (1) put about 160 c.cm. distilled water. By immersing this in a jug or other vessel of hot water, raise the temperature to 100° F. Measure 0·075 c.cm. of avertin fluid per kg. of body-weight. (This has frequently to be guessed, but it is not essential to be exact.) For example, 9 st. equal 126 lb., equal roughly to 60 kg. Sixty times 0·075 c.cm. equal 4·5 c.cm. Add this to the distilled water, insert cork and shake vigorously. (It is important first to raise the temperature to 100° F., or solution is delayed.) Take a few c.cm., say 5, of solution back into the small measure and add a couple of drops of Congo red solution. The colour *must not* change. I have never found a blue discoloration, showing presence of free dibromacetaldehyde. The temperature should again be raised to 100° F., and the solution is ready for use. Just after a good long strong contraction has passed, a catheter should be inserted high into the rectum and about 50 c.cm. run in fairly quickly. When the next contraction comes it is usually a small one, but strong pressure must be made round the anus, and the patient told *not* to bear down, or much of the fluid may be lost. There is seldom any difficulty in retaining the bulk of it.

After the first contraction is over, the rest of the avertin solution should be passed in, the process extending over about 15 minutes, and firm pressure being applied to the anus during a pain. By this time, however, the patient is probably asleep and does not bear down strongly. The fluid soon makes its way up past the point where the child's head is pressing on the rectum, and after about half an hour from the commencement of the injection there is no tendency for any to return.

The Advantages of Avertin.

It is necessary to examine how far this procedure fulfils the required conditions.

1. *Safety.*—The dosage I have used, 0·075 c.cm. per kg. body-weight, is well within the safety limits, according to my own experience and the literature. For general surgical practice 0·1 and even 0·125 c.cm. have been used, with good results reported. But such doses are unnecessary in labour and should not be used. I have never had a moment's anxiety about the condition of the patient. The table of typical cases shows a small increase in the pulse-rate. The blood pressure drops very shortly after the administration, but only slightly in most cases. Prof. W. Benthin, of Königsberg, reports a drop of 10–20 mm. Hg in 25 per cent. of cases, 30–40 in 25 per cent., slightly more in several, and in 19 cases the fall was 60 to 100. My cases have never gone so low as the latter, and even in his, with larger doses, the fall has been of short duration. It quickly returns to a few mm. Hg below normal. The patient, however, is in a very deep sleep, similar to alcoholic coma, and must not be left alone. Any good midwife may be left in charge to see that no respiratory interference is brought about by the patient's movements such as bending the neck or burying the face in the pillow.

As regards the child, in two cases I had to use forceps, since the head had lain long on the perineum, and the beat of the fœtal heart was lost. But this may happen in a non-anæsthetic labour, and in both cases I was over anxious—one was that of a doctor's wife. Here the delay was rather due to the excessive use of morphia and gas and oxygen. In one other case my assistant had a similar experience. In all three cases the child cried lustily immediately, and after birth showed no effects whatever.

2. *Ease of Administration.*—This has been fully explained in describing the technique. There are no "snags," except the partial return of the injection if run in too rapidly, and if the anus is not controlled.

3. *Effective Mitigation of Pain for a Sufficient Period.*—Avertin, in the obstetric dosage, is not an

analgesic or full anæsthetic. The patient, under the doses I have used, is conscious of the stronger contractions and of *some* pain, and frequently bears down strongly. Between pains, however, she is fast asleep, and thus avoids what I think is the main cause of distress and shock—namely, the constant intercontraction sacral pain. Apprehension is also removed, giving mental rest. The duration of action of avertin varies, like everything else in labour. Prof. Benthin gives 1 to 1½ hours for narcosis deep enough for major gynæcological operations. Prof. E. Martin, of Elberfeld, with a dose of 0·6 c.cm. per kg. body-weight, gives 1¾ hours in cases of childbirth; but I have found the effective duration much longer. The dose may be repeated, however, with safety, and Mr. C. C. Coghlan, of Sydney, has reported eight cases where three doses were given with no bad after-effects. But for the busy general practitioner I think one administration may suffice, and at least give a sufficient duration of action to prove a very valuable aid. I have never yet repeated the dose, contenting myself with giving whiffs of chloroform or ether for the final pains, if necessary.

4. *Absence of After-results to Mother and Child.*—The condition of the child is generally better than after an ordinary unassisted labour. In two cases the child has been somewhat sleepy, but in all the others it cried at once and behaved thereafter normally. One stillbirth was due to excessive moulding of the head with intracranial hæmorrhage. There is no such anxiety as is usually present after scopolamine and morphine. This factor alone made me unwilling to continue to use that method. Mr. Coghlan reports one case out of eight where the child was born "slightly blue and sleepy" after avertin. As to the mother, one case, that of the doctor's wife above mentioned, had paresis of the bladder leading to temporary retention. As this is by no means unknown in normal cases, I scarcely like to blame avertin for it. In all other respects the condition of the mother has been excellent. She is not exhausted. She sleeps naturally for some hours after parturition, and awakes apparently in normal healthy condition. No delay in the milk flow was noticed. Involution of the uterus was not affected. Since in most cases the use of avertin has avoided forceps the vaginal and vulval condition is improved.

5. *Absence of Undue Prolongation of Labour.*—It is here that antagonists to any form of anæsthesia make their most important point. The ground for such objection appears to me somewhat unstable. The duration of normal labour varies within such wide limits, owing to such varying factors, that any small prolongation is of little importance. Much is made of the want of "bearing down" by the mother. But the most perfect parturition I have ever seen was in a patient who had transverse myelitis, where no bearing down and no pain were present. The uterus is normally quite able to expel its contents unassisted by other means, and the absence of bearing down is an asset rather than detrimental.

The figures for prolongation of labour due to avertin, however, are not serious. Prof. Martin gives an average for the second stage (I do not completely understand where he places his initial point) as 3·7 hours for unassisted labour, and 4·6 hours with avertin. Mr. Coghlan's average for total duration of labour is 14 hours, and he uses more avertin than I have recommended. My figures show that labour is prolonged, but in no degree to affect the child, and so long as the mother is quiet and easy, only the doctor's time has to be considered. If the above technique and arrangement of dosage are carried out, this loss of time may not be serious. The third stage of labour is not delayed, except in such cases as delay may be expected for other reasons.

6. *Portability.*—The apparatus goes easily into a small hand-bag, and a fairly large size midwifery bag will accommodate everything without difficulty.

Conclusion.

In conclusion, it might be stressed that the use of avertin in childbirth, in my hands, has not given a painless labour. Nothing short of full anæsthesia will do so. But with avertin it is possible to make things so easy for the patient that she has no devastating pain, no prolonged backache, no exhaustion, and no memory of a terrible experience to jaundice her outlook on life. Prof. Martin recommends the solution of avertin in milk instead of distilled water, and says that the duration of action is thereby considerably prolonged. I have not used this to any extent, and have found the simpler method satisfactory enough. It has been noticed that the uterus is rather less firmly contracted at the end of the third stage than is usual in primiparæ, and that the loss may be rather more free. This has never given rise to any anxiety, and but seldom calls for an injection of pituitary extract, which, of course, is not given as a routine in primiparæ. In all the cases at which I have been present I have left the patient with perfect confidence, in the charge of an ordinarily trained midwife, immediately after the end of the third stage. There is no such laxity of the musculature as is seen after chloroform administration, and any slight laxity which may be due to the drug is probably compensated for by the absence of exhaustion and shock.

My experience leads me to think that this method of easing the pains of labour is worthy of trial by the general practitioner. It is not fool-proof but a very little practice is all that is necessary, and even a faulty administration, where much of the solution has been returned, has proved of benefit.

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COMPARATIVE RESEARCHES ON THE GALACTOSE AND LÆVULOSE TEST FOR HEPATIC EFFICIENCY.

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AND

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THE administration of galactose and lævulose for estimating hepatic efficiency has been largely used by different clinics. Bauer and Strauss's method of detecting galactosuria and lævulosuria involves a renal factor, and many workers, therefore, prefer to examine the blood-sugar curve. Some, however, (Bauer, Kahler and Machold, Noah, Davies,[1] Meller and Frisch,[2] and others) prefer the galactose tolerance-test, and others (Strauss, Schirokauer, MacLean and Wesselow, Spence and Brett, Hetenyi, Tallermann and Kennet, Finkelstein and Dannenberg, King[3] and others) use the lævulose tolerance-test. The clinical value of galactose and lævulose has been discussed

by Lepehne,[4] but no comparative researches have been published.

We have made comparative researches on these two tests to find whether they have a comparable clinical importance, or whether one of them is better, and which is the more reliable tolerance-test of hepatic efficiency.

Technique of the test.—In every case, after a thorough clinical investigation, we examined the fasting blood-sugar and then gave the patient 40 g. of galactose in tea. Then, at half-hourly intervals for two hours, we tested the blood-sugar by the micro-method of Hagedorn-Jensen. At the same time during a period of six to eight hours we collected the urine and determined the percentage of sugar in it by polarimetry. Two days later we repeated this test with 45 g. of lævulose. Then we performed the test with tetrachlorphenolphthalein according to the method of Rosenthal and Kunfi, by injecting 5 mg. per kg. of body-weight. Later we tested the blood to find the dye retention in the serum. Moreover, we determined the bilirubin in the blood-serum quantitatively according to Hijmans van den Bergh, and examined the urine qualitatively for the urobilinogen reaction.

Like Kahler and Machold, we considered the galactose test positive if the blood-sugar had risen over 30 mg. per cent. We find the examination of the galactose in the urine insufficient, as we have noted before,[5] since we have found seven cases in which the rise of blood-sugar far exceeded 30 mg. per cent., yet there was little or no sugar in the urine.

Opinions differ more about the lævulose test. According to some workers the rise of sugar in normal cases does not exceed 10 mg. per cent., after giving 40–50 g. of lævulose (Schirokauer, Isaak, MacLean and Wesselow, Spence and Brett); on the other hand, other writers (Tallermann and Kennet, Greene, Snell and Walters,[6] Brown,[7] and others) say that it may rise much higher, and they consider the lævulose test to be positive only after a rise of blood-sugar to over 30 mg. per cent. We have stated that in normal cases the highest rise of blood-sugar is 20 mg. per cent., and that is why we consider the lævulose test as positive when this figure is exceeded. We need not add that the examination of lævulosuria after 45 g. of lævulose has been given is completely deceptive. The variation in the rise of blood-sugar after the lævulose is to be explained as due either to impurities in the lævulose or to unsuitable methods of storing it,* or to variations in its absorption from the mucous surfaces.

A NEW INVESTIGATION.

We have investigated 41 cases of hepatic inefficiency. The value of the galactose and lævulose tests appeared in this series to be identical. In 14 cases, however—that is in one-third—the results were different. The height and duration of the rise in blood-sugar after the administration of galactose was not parallel with the curve of lævulose; the blood-sugar curve was flatter after the lævulose than after the galactose in five cases, while in three the lævulose test was slightly positive, and in four it was completely negative. Only in one case was the lævulose test positive (+ 39 mg. per cent.), with a negative galactose test (+ 28 mg. per cent.).

Consequently, we consider that the galactose test is better than the lævulose test. The metabolism of galactose, unlike the metabolism of lævulose, is performed primarily with the coöperation of the liver and not with other tissues (Fischler [8]). We do not wish to assert that the galactose test is always sure, but so far as we know galactose metabolism depends not only from the condition of the liver but also on the capacity of assimilation of other tissues (Achard and Desbouis[9]).

* We administered the lævulose of Schering, which was preserved in a dark jar hermetically sealed.

SUMMARY AND CONCLUSIONS.

The galactose and lævulose tests do not agree in one-third of all cases of hepatic disorders. In some cases the lævulose test in the presence of a positive galactose test is slightly positive or completely negative. The galactose test is very much more valuable than the lævulose test in the diagnosis of hepatic disorder.

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PUERPERAL INFECTION:

A BACTERIOLOGICAL STUDY.

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IT is generally believed that the *Streptococcus pyogenes* is the most common infecting agent in severe puerperal infection. In less severe infections, however—e.g., mild localised uterine infections—it does not commonly appear to be the causal organism.

Colebrook and Hare [1] reported that out of 1626 women delivered at Queen Charlotte's Hospital, there were 134 "morbid" and "clinically septic" cases. Of these, only ten (8 per cent.) yielded a culture of *S. pyogenes* from the uterus. In the remainder the predominant organisms recovered from cultures were diphtheroid bacilli, *B. coli*, non-hæmolytic streptococci, and various unclassified Gram-negative organisms. White [2] in Melbourne, out of a series of 25 cases of so-called "sapræmia" bacteriologically examined, reported only one infection due to *S. pyogenes*. Armstrong and Burt-White [3] stated that out of 34 cases of puerperal pyrexia of genital origin this organism was found in only eight instances.

METHOD OF INVESTIGATION.

Eighty-nine cases notified as puerperal infection have been investigated. Every case on admission to the Edinburgh City Hospital had a blood culture and uterine culture taken. Only aerobic cultures were made. Anaerobic organisms are said to play only a very minor part in the production of the disease, and Kinloch, Smith, and Stephen,[4] in their investigations on maternal mortality in Aberdeen, made only aerobic cultures. The uterine culture was made at the bedside. A blood-agar plate was inoculated in the usual way and immediately taken to the laboratory and incubated for 20 hours at 37° C. The plate was then examined for hæmolysis and suitable colonies were selected for further examination. Hæmolytic streptococci were easily identified. The colonies were small, round and dew-drop in size, being more opaque at the centre than the periphery. Hæmolysis was noted by a small circular clear area surrounding each colony. In 27 of the cases investi-

gated further steps were taken, and all types of streptococci were classified according to Holman.[5] Suitable colonies of streptococci were picked off the blood-agar plates, and cultures of peptone water agar containing the sugars lactose, mannite, and salicin were inoculated. This medium was prepared as follows:—

Ordinary peptone water was solidified with 2 per cent. agar, just enough litmus being added to colour the medium a light blue. The sugars (lactose, mannite, and salicin—all 10 per cent. sterile) were then added while the agar was warm. 0·5 c.cm. of 10 per cent. sugar was added to 5 c.cm. of medium and the culture sloped in the usual manner. After solidification had taken place a few drops of sterile human serum were run over the surface of the medium by means of a large platinum loop. After inoculation these cultures were incubated for 48 hours and then examined for fermentation. If fermentation occurred it was invariably always noted first near the bottom of the tube.

CLASSIFICATION OF CASES.

There were 61 cases of localised uterine infection, 9 cases of pelvic inflammation, 3 cases of general peritonitis, 14 cases of septicæmia, 1 case of paratyphoid B complicating the puerperal state, and 1 case of puerperal insanity.

Types of Organisms Cultured from the Uterus in 89 Cases of Notified Puerperal Infection.

Organisms.	Cases.
Hæmolytic streptococci (pure)	24
,, ,, and other organisms	12
Non-hæmolytic streptococci (pure)	19
,, and other organisms	6
B. coli (pure)	2
,, and other organisms	7
Gonococci and other organisms	2
Staphylococcus aureus (pure)	1
,, *albus* (pure)	1
Enterococcus (pure)	1
Unidentified Gram-positive bacilli (pure)	2
Unclassified ,, ,, cocci (pure)	1
Other organisms (mixed)	4
Sterile	5
Contaminated	2

In two cases the uterine culture was accidentally contaminated. Five cultures were sterile. These were taken from cases as follows:—

The first was a case of serum disease. The patient had received antistreptococcal serum 14 days before.

The second was sent into hospital as a "contact" case and suffered from *B. coli* bacilluria.

The third case was not a case of puerperal infection and had no symptoms or fever while in hospital.

The fourth was admitted to hospital on thirtieth day of puerperium suffering from general peritonitis.

The fifth case was one of paratyphoid B complicating the puerperium.

Accordingly the following figures are based on a total of 82 uterine cultures, from which hæmolytic streptococci were obtained in 36 cases (44 per cent.) either in pure culture or in association with other organisms. Hæmolytic streptococci were present in pure culture in 24 cases (29 per cent.). Eleven of these cases were severe septicæmias, all giving a pure growth of hæmolytic streptococci on uterine culture.

In 27 Cases in which the Streptococci were Classified, the types were as follows.

	Uterine culture.	Cases.
Hæmolytic	*S. pyogenes* (pure)	11
	S. anginosus (pure)	1
	S. pyogenes with *Staph. albus*	1
	S. pyogenes with enterococci	1
	S. hæmolyticus III. with enterococci	1
Non-hæmolytic	*S. facalis* (pure)	7
	S. salivarius (pure)	2
	S. ignavus (pure)	1
	S. salivarius with diphtheroids	1
	S. non-hæmolyticus I. with *B. coli*	1

Of the 11 cases giving a pure growth of *S. pyogenes*, eight were cases of puerperal septicæmia.

Out of the 89 cases, 11 died. One patient with general peritonitis died. Her blood culture was negative, and the uterine culture gave non-hæmolytic streptococci. The other 10 deaths occurred in septicæmia cases.

EXAMINATION OF CULTURES.

The following results were obtained on examination of the blood cultures and uterine cultures of the 14 cases of septicæmia. In this group there were ten deaths—a mortality of 71·4 per cent. Nine cases had streptococci in the blood—in eight cases hæmolytic streptococci, and in one case non-hæmolytic streptococci. Seven cases with hæmolytic streptococci in the blood stream died and one recovered. The one case with non-hæmolytic streptococci in the blood recovered. There was one case with *B. coli* in the blood which recovered. In four cases the blood was sterile; three of these cases died and one recovered. Clinically all four were cases of septicæmia. Of the three which ended fatally, two gave a pure growth of hæmolytic streptococci from the uterus, and the third gave a pure growth of non-hæmolytic streptococci. The fourth case which recovered gave a pure growth of hæmolytic streptococci on uterine culture. The mortality of the cases in which streptococci were found in the blood stream was 77·7 per cent. Of uterine cultures taken from the 14 cases of septicæmia, 11 were found to give a pure growth of hæmolytic streptococci. The uterine culture was further examined for the causal streptococcus in eight of these cases, and *S. pyogenes* was found in every one. Two cases gave a pure culture of non-hæmolytic streptococci, one being *S. fæcalis*. One case gave a mixed growth of *B. coli* and *S. non-hæmolyticus I.*

CONCLUSIONS.

1. Hæmolytic streptococci are associated with the severe and fatal forms of puerperal infection, in which there is a complete absence of the less virulent organisms which are so closely related to the much milder forms of the disease. 2. The milder forms of puerperal infection are due to a localised uterine infection caused by a variety of organisms, including non-hæmolytic streptococci, *B. coli*, Gram-positive bacilli, and Gram-positive cocci (unclassified). 3. Uterine cultures are useful in forming a diagnosis and in giving a prognosis. 4. The prognosis is serious when *S. pyogenes* is obtained in pure culture from the uterus, as it indicates a virulent and severe infection. 5. The prognosis is fair, but must be guarded when non-hæmolytic streptococci are obtained from the uterus. 6. The prognosis is favourable when a mixed growth of organisms is obtained from the uterus, as their presence is associated with a mild and localised type of disease.

I wish to express my thanks to Dr. W. T. Benson, medical superintendent, Edinburgh City Fever Hospital, for his permission to carry out this study and for his ever-ready help.

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NORTH STAFFORDSHIRE SMALL-POX HOSPITAL.—Two pavilions, containing 36 beds, have been added to Bagnall Hospital, which belongs to the North Staffordshire Joint Small-pox Hospital Board.

CLINICAL AND LABORATORY NOTES

NIRVANOL IN THE TREATMENT OF CHOREA.

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This paper gives an account of the effects of nirvanol on 15 cases of chorea. In the series the ages range from 6 to 21 years.

The severity of the disease has varied a good deal. Four grades have been arbitrarily represented by the figure 1 for the mildest, to 4 for the most severe. These and other points are set out in the Table.

REVIEW OF THE CASES.

History of Illness.—Thirteen of the 15 patients were suffering from their first attack of chorea. Eleven of these had been ill for less than four weeks. Two had been ill for six months and four months respectively. Thus it will be seen it is in early cases for the most part that the effect of the drug is illustrated.

The Action of Nirvanol.—The patient usually shows a reaction to the drug after a few days. This period, with ordinary dosage, is commonly of nine to eleven days' duration. It may be as short as six or as long as fifteen days. The phenomena of this "reaction" are remarkably variable. The syndrome which has

(1) No. of case.
(2) Sex.
(3) Age.
(4) Severity.
(5) Weight.
(6) Amount of drug (in grammes).
(7) Time before reaction (in days).
(8) Rash.
(9) Fever.
(10) Quickened pulse-rate.
(11) Increase in chorea before reaction.
(12) Drowsiness.
(13) Onset of improvement in days since drug started.

(1)	(2)	(3)	(4)	(5) st.	(5) lb.	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	F.	12	3	6	5	2·65	9	+	+	+	+ +	+	14
2	F.	20	3	6	13	4·15	10	0	0	0	0	+ +	14
3	M.	8	2	3	11	0·9	6	+	+	+	+	+	11
4	F.	21	4	5	13	2·25	8	0	0	0	0	+	8
5	F.	8	2	3	5	2·7	9	+	+	+	0	0	13
6	F.	13	2	5	10	2·4	8	0	+	+	0	+	11
7	F.	19	2	7	2	7·2	15	0	+	+	0	0	gl.
8	F.	8	3	3	3	4·2	11	+	0	+	0	0	12
9	M.	6½	1	3	4	1·0	10	0	0	0	0	0	0
10	F.	14	1	7	2	1·5	10	+	0	0	0	0	10
11	M.	9	3	—		1·8	6	+	+	+	+	0	?
12	F.	13	2	—		1·8	10	+	0	0	0	0	11
13	F.	14	2	7	8	2·1	8	0	0	0	+	0	11
14	F.	18	3	7	10	3·9	10	+	0	0	+ +	+	10
15	M.	7	1	3	2	1·1	11	0	0	0	0	0	0

gl. = gradual.

been described as characteristic is said to have three features: (1) fever; (2) a quickened pulse-rate; (3) rash. In our cases this triad only appeared four times. But one or more of the symptoms are usually seen. For instance, in three patients the rash was present alone, in one fever and quickened pulse came without the rash, and once there was quickening of the pulse, and the rash appeared without fever. The temperature may rise to 102° F. The heart may accelerate to 120 or 140 beats a minute.

The *rash* is a morbiliform eruption. It is not unlike that caused sometimes by sanocrysin. It does not always appear first in the same places. We have noticed it first on the trunk, chiefly the front, spreading to the face and limbs and back. The maculæ are reddish, bright at first, and then more dusky. Later they coalesce to a brilliant sheet of intense colour which is most pronounced on the extensor surfaces of the limbs. The buccal mucosa may be flushed and show tiny dewy vesicles. Irritation is not troublesome. Desquamation does not occur. The eruption usually begins to fade on the third day. The "reaction" lasts from three to four days.

Increase in the symptoms of chorea, which is sometimes seen, may be disturbing for two or three days before the "reaction." It may even occur when no reaction takes place.

Drowsiness was notable in six cases. In two it amounted practically to coma. On its appearance the drug was stopped and the symptoms of the disease

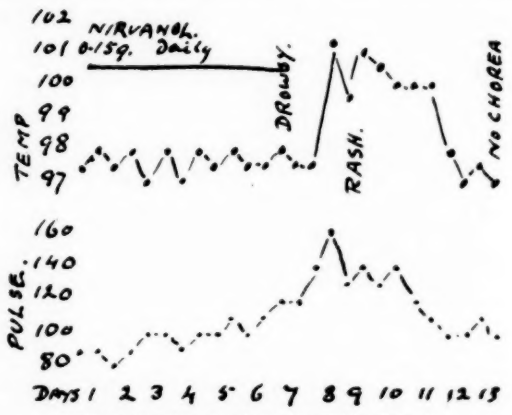


Chart showing effect of nirvanol in Case 5.

cleared up. Three patients were drowsy and showed no further reaction.

Improvement is usual, and took place 8 to 14 days after starting the treatment. It follows the reaction at once, though the reaction is not necessary to the improvement. Five did well without showing a rash. The symptoms cleared up quickly in three cases. The two patients who did not improve showed no response to the drug of any sort.

Dosage.—The drug was given by mouth twice daily. In three cases only was a daily dosage of 0·3 g. exceeded. To two of these 0·4 g. was given daily, and to one 0·5 g. The largest total amount given was 7·2 g., and the smallest 0·9 g. The drug was administered over periods varying from 6 to 15 days. A reaction, when it occurred, was a signal to stop the drug.

Unusual Effects.—In two cases a fall in pulse-rate was the only obvious form of response. In one patient 2 : 1 heart-block appeared for one day during the exhibition of the drug. It is worth noting that two patients developed rheumatic fever shortly after the nirvanol reaction.

Cardiac lesions were present in six of our cases and did not appear to be in any way affected.

Positive results.—Of the 15 cases, 12 were greatly improved, 1 moderately, and 2 did not respond.

CONCLUSIONS.

It is not possible to foresee what reaction the drug is going to produce. The symptoms of this reaction

may not be dangerous, but they are certainly at times disturbing.

The symptoms of chorea are improved and the attack is cut short in quite a dramatic manner in many instances. The question is whether it is right to use a drug which can produce so variable and uncertain a reaction to treat a disease which is said to be self-limited. The main justification would rest upon demonstration that the abolition of chorea prevented the onset of carditis. This still remains to be proved. We do not know that the rheumatic infection is abolished, in fact two of our cases point to the opposite.

For these reasons we think that the use of nirvanol should be restricted to cases which show no signs of improvement after four or five weeks' treatment on ordinary lines. It should only be used when constant supervision is available.

A CASE OF THROMBO-ANGIITIS OBLITERANS.

By G. Norman Clark, M.B. Aberd.,

HOUSE SURGEON, HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

A man, aged 40, was admitted to the Hampstead General Hospital on March 6th, 1930, complaining of pain and swelling of his right leg.

ACCOUNT OF THE ILLNESS.

He had experienced pain on the outer side of the calf on sudden movement for the last seven years. In October, 1929, he had had similar pains on walking, and after being in bed an hour or so his foot had become numb. This numb feeling had been relieved by hanging the leg out of bed. A month later there was constant pain in the foot, which was pink and swollen. On account of the swelling and pain he had remained in bed from the middle of December until the end of January, but there had been no improvement in his symptoms. Since then the pain, redness, and swelling had been getting worse. His previous health had been quite good. He was not a drinker but smoked between 25 and 30 cigarettes a day. He had been a keen hockey player since the age of 16 and had been goalkeeper at football for the last 15 years. He could not trace any Jewish ancestry.

He was a well-nourished healthy-looking man. There was marked swelling of the right foot and leg with redness of the toes and the distal part of the foot. The swelling pitted on pressure and on elevation of the limb the redness faded away, the limb becoming quite blanched. There was a discharging area on the plantar aspect of the little toe which had been incised three weeks previously, a mis-diagnosis of sepsis having been made. The outer aspect of the little toe was painful and tender and there was an indurated tender area with redness of the skin on the inner aspect of the right calf. Below the inner tuberosity of the tibia there was a patch of phlebitis of the long saphenous vein which was painful and very tender. Pulsation could not be made out in any of the arteries of the legs distal to the femorals in Scarpa's triangle. The right pulse at the radial was weaker than the left, which could be felt readily. No pulsation could be felt in the antecubital fossæ. The blood Wassermann and Meinicke reactions were negative and a radiogram of the leg showed no evidence of calcification of the arteries. The heart sounds were weak but no murmurs were heard. His blood pressure was 115 mm. systolic and 75 mm. diastolic.

The pain was very severe while in hospital, being relieved by hanging the leg out at the side of the bed; even nepenthe ℥x. at night did not relieve it with any certainty. Ultra-violet light was tried locally, with temporary relief of the symptoms.

On March 31st the swelling was more marked, and extended up beyond the middle of the leg, and the pain was so severe and constant that the patient wished to have his leg amputated. Injection of the short saphenous and plantar nerve to the outer side of the little toe with 0·5 c.cm. and 0·25 c.cm. of absolute alcohol respectively gave him temporary relief from the pain in the little toe.

Amputation above the knee was done on April 8th by the long anterior and short posterior flap method. The wound healed well and the patient had an uneventful convalescence except for occasional "phantom pains." He was discharged on April 30th.

The arteries of the amputated limb and the short saphenous nerve at the point of injection were dissected out; likewise the thrombosed segment of the long saphenous vein below the internal tuberosity of the tibia. There was considerable difficulty in dissecting out the vein, which was bound down to the surrounding tissues.

PATHOLOGICAL REPORT.

Dr. C. R. Lane reported on the condition as follows:

The popliteal artery is occluded by a thrombus one inch below the line of amputation; above this there is no thrombus. At the point where it is occluded the adventitia is thickened and tends to merge into the surrounding tissues: the vasa vasorum show a little endarteritis and peri-arteritis, but these are far from being marked; where they do occur, increase in elastic tissues is marked. The media shows intense degeneration of the muscle, especially internally, being replaced, not by fibrous tissue, but by elastic tissue apparently derived from the elastic fibres of its innermost layers. Its vasa vasorum are dilated. The internal elastic lamina is reduplicated and markedly fragmented in places. The intima is merged into the thrombus, which is completely organised and consists of fibrous tissue, in places hyaline, with many small vessels showing endothelial and muscular coats with little or no elastic tissue. Nearest the internal elastic lamina the thrombus shows an enormous amount of elastic tissue, apparently derived from the internal elastic lamina. In the centre are cells bearing altered blood pigment.

In the region where the popliteal artery is patent there is some endarteritis, again with much elastic tissue and reduplication of the internal elastic lamina. There is degeneration of the media, especially internally, with a good deal of elastic tissue, but also some loose fibrous tissue; the adventitia is well defined. The vasa vasorum do not show endarteritis. The popliteal vein shows endophlebitis, mainly due to increase in elastic tissue in the subendothelial region. It is patent but shows commencing thrombus formation.

The anterior tibial artery shows marked canalisation of the thrombus and rather more endarteritis of the adventitial vasa vasorum, but otherwise a similar great increase and reduplication of elastic tissue. There is endophlebitis of the venæ comites. The dorsalis pedis artery is not blocked, but there is marked narrowing of the lumen by increase of the subendothelial tissue, largely by elastic tissue. The media is fairly well preserved. There is increase of the elastic tissue of the adventitia. Endarteritis of the vasa vasorum is not marked. The posterior tibial artery and its branches are not blocked; they show similar changes to the dorsalis pedis artery but with less elastic tissue. Endarteritis of the vasa vasorum is more marked. The internal plantar artery is similar to the dorsalis pedis. The external plantar artery is also similar to the dorsalis pedis, but the subendothelial tissue shows extensive canalisation. One vein is also in a similar condition, but the subendothelial tissue is more fibrous and has very little elastic tissue. The long saphenous vein contains an extensively canalised organised thrombus showing much elastic tissue; there is considerable diffuse round-celled infiltration round the vasa vasorum. The short saphenous nerve shows considerable fibrosis with destruction of nerve-fibres.

Apparently the condition was an affection primarily of the elastic tissue and intima, the effects on the media being secondary. Great increase of elastic tissue is not usually described in thrombo-angiitis obliterans, but the more advanced stage seen in the popliteal artery is the usual finding in that disease.

I wish to thank Mr. W. H. Ogilvie, who had charge of the case, for his kind permission to record it, and Dr. Lane for permission to publish his report on the microscopic findings.

Smoking in Hospital Wards.—In future male patients in Bath Royal United Hospital are to be allowed to smoke in the wards between 7 and 8 A.M., 1 and 2 P.M., and 6 and 7 P.M. The resident medical staff are, however, empowered to prohibit smoking when it appears likely to be prejudicial to the health of any patient.

REVIEWS AND NOTICES OF BOOKS

Epidemic Encephalitis.

ETIOLOGY, EPIDEMIOLOGY, TREATMENT. Report of a Survey by the Matheson Commission. New York: Columbia University Press. Pp 849. 15*s*.

WE know from Sir Thomas Browne that "some allow that such diseases which are esteemed new will have but their time." Neurologists are already beginning to apply this dictum to epidemic encephalitis as they mark a progressive diminution in hospital and clinic of cases of the disease. Yet it is too early to look upon epidemic encephalitis purely as medical history; 1037 cases of the disease were notified in England and Wales during the year 1929. Whether or no epidemic encephalitis is to become a tale that is told it is of paramount importance to collect all available data about its manifestations. Mr. William J. Matheson decided to have the information scattered in journals or monographs in every language brought together and tabulated so as to be generally available. With his financial support and at his instance a Commission was appointed to represent the laboratory, clinical and epidemiological points of view. The actual detailed work was done by Dr. Josephine B. Neal, who analysed the 428 pages of the bibliographical section of the report, and also visited England and the continent of Europe in order to confer personally with the chief workers on epidemic encephalitis. The result of the Commission's labours is this book, which, illustrated by many statistical tables, charts, and diagrams, has assembled in succinct form the known facts relating to the manifestation of epidemic encephalitis throughout the world.

For the most part the Commission have desired to put evidence before the reader without drawing any very definite conclusions. This is particularly to be remarked in the epidemiological section. The examples of epidemic outbreaks and of apparent case-to-case infection are cited side by side with instances of outbreaks in which no such association is manifest. Reference might have been made to the views which harmonise these apparent discrepancies by adducing data relating to mild and abortive cases of epidemic encephalitis and the possibility of "carriers" of the virus. On the analogy of two other epidemic diseases of the central nervous system —cerebro-spinal meningitis and acute poliomyelitis— it seems likely that epidemic encephalitis is infective and liable to manifestation in epidemic form. A chapter is devoted to other types of encephalitis, including post-vaccinal encephalitis. More information is certainly required not only about the pathology and symptomatology of the forms of encephalitis which follow on acute infectious diseases, notably measles and small-pox, but also (as the work of W. R. Brain and others indicates) about the sporadic and epidemic forms of encephalitis which now occur with greater frequency in our midst. The problem of the ætiology of post-vaccinal encephalitis is still unsolved. Some consider it possible that vaccination produces diminished resistance to disease and that an organism of encephalitis, already present without causing any symptoms, becomes pathogenic; others believe that the condition is due to the introduction of a neurotropic virus with vaccine lymph.

We are glad to note that the Matheson Commission is continuing its work on epidemic encephalitis and that the results of further studies of the causes, treatment, and sequelæ of the disease will be published from time to time.

Diseases of Women.

Fourth edition. By Ten Teachers under the direction of COMYNS BERKELEY. Edited by COMYNS BERKELEY, H. RUSSELL ANDREWS, and J. S. FAIRBAIRN. London: Edward Arnold and Co. 1930. Pp. 558. 18*s*.

AMONGST the text-books commonly used by medical students, Diseases of Women and its companion volume Midwifery by Ten Teachers rank second to none in popularity. Collective authorship necessarily involves compromise over debatable points and this in turn usually means that the product lacks those dogmatic statements which are essential in all elementary teaching. In this book, however, the student will have no difficulty on this score although in later life he may find that he has to revise some of his ideas. To get representatives of nine London schools to agree to a uniform teaching is a triumph, and even a greater one when agreement can be maintained over a term of years. In this edition the whole book has been completely revised, and recent work has been incorporated in the text. The authors have restricted the additions as far as possible to established facts and have avoided theories and contradictory statements. This treatment of new work may seem unsatisfactory to the specialist, but it greatly simplifies the subject for the average student for whom the book is written. The treatment of carcinoma of the cervix is not very clearly described. Technical details are given of both operative and radiological methods, but the student is left without any guidance about the relative positions these two lines of treatment hold in this and other countries. A great reduction in the weight of the book has been brought about by the use of lighter paper.

The student will find no better text-book to help him through his examinations, and in later life he will find it an equally valuable friend in practice.

Introduction to Human Parasitology.

By ASA C. CHANDLER, M.S., Ph.D., Professor of Biology, Rice Institute, Houston, Texas. New York: John Wiley and Sons; London: Chapman and Hall, Ltd. 1930. Pp. 655. 25*s*.

THIS book is an elaboration of one entitled "Animal Parasites and Human Diseases" by the same author written 12 years ago. It is pleasant to see recorded the assistance he has obtained in the interim from the *Tropical Diseases Bulletin* among other journals. Prof. Chandler has produced a sincere and readable book, not overburdened with tiresome details on human parasitology. Throughout the work special emphasis has been laid upon the biological aspects of the subject, and considerable space has been devoted to life-cycles, epidemiological factors, and underlying principles of treatment and prevention. The introductory chapters on parasites are good and we may note that in the controversial subject of nomenclature no attempt has been made to give a synonym, but, whenever there has been disagreement between European and American usage the latter has always been adopted. Prof. Chandler is patriotic enough even to countenance the inclusion of *Councilmania* as a well-established genus of amœba parasite in man; some may regard him as uncritical for including bronchial spirochætosis as a distinct

entity, attributed to a specific organism, *Treponema bronchiale*. The illustrations are a little disappointing, both in number and in quality. Fig. 287 is a caricature of *Aedes calopus* (sic), the yellow fever mosquito, which is quite out of proportion. Why should it be named *calopus* on one page and *aegypti* on the next?

We have recently had occasion to welcome standard works on modern protozoology, medical entomology, and helminthology in the English language. The production of a comprehensive work on human parasitology is timely, and this volume gives clearly and with good judgment all the information which readers will seek to find in its pages.

Psychology, Normal and Abnormal.

By J. W. BRIDGES, Professor of Psychology in the Faculty of Medicine of McGill University. London: D. Appleton and Co. 1930. Pp. 532. 12*s*. 6*d*.

THIS is one of the most comprehensive text-books of psychology that has appeared for some time past. In a brief opening chapter the author defines psychology from various aspects, and relates it very ably to the related sciences of biology, the normative sciences, other mental sciences, and the pseudo sciences (spiritism, &c.). He then defines the relation of normal to abnormal states in a succinct manner, and discusses the philosophic foundation of the subject. The neurological substratum or correlates of mental activity and behaviour are considered at some length and a systematic study on orthodox lines is made of functions. The relationship of functions to applied psychology and psychopathology are critically examined. The references to psycho-pathology throughout the book are considerable though necessarily brief.

Students of medicine who are not to be satisfied with oddments of psychology will find the book interesting and informative.

Treatment in General Practice.

By HARRY BECKMAN, M.D., Professor of Pharmacology at Marquette University, Milwaukee, Wisc. London: W. B. Saunders Company. 1930. Pp. 899. 45*s*.

DURING the past 15 years applied physiology has steadily come into its own by the orderly filling up of the breach between medicine and physiology, but therapeutics has been largely excluded from this happy union. Medical men have, in consequence, fallen back according to their individual temperaments either upon therapeutic nihilism or, contrariwise, upon the easily assimilable brochures provided by enthusiastic theorists or industrious manufacturers. Dr. Beckman in this outstanding book steers a course from which both these points of view are excluded. Being both pharmacologist and physician, he is in a position to do so. And yet, great as has been and is the need for the literature of applied pharmacology, this book is more than that. It is a most painstaking and exhaustive analysis of orthodox and putative therapeutics in medicine (surgery and midwifery are not included), written critically and giving details of technique and dosage. In the preface Dr. Beckman decries the current principle that the art of treatment "comes" if only one has mastered the art of diagnosis, and the book is an attempt to shake, however feebly, the false foundations of such beliefs. Yet nowhere in the book will it be found that the treatments discussed are independent of diagnosis properly made. This tribute should not be taken to imply that students will find here any rule-of-thumb index of treatment. Far from it: the book is one written by a tutor and not by a "coach." Two full pages, for instance, on the successful treatment of diabetes mellitus by myrtillin will certainly not be found to be lightly transferable to a daily prescription sheet, and the section on asthma will probably leave the average doctor wiser chiefly by his increased recognition of the darkness surrounding the subject. But, nevertheless, many refreshing passages should help him to increase the efficiency of his armamentarium in the treatment of hæmoptysis, syphilis, chronic nephritis, herpes zoster, eczema, and a host of other diseases when diagnosis has been established.

This book or its equivalent should be in the hands of every physician, and we have not yet come across its equivalent.

Radiographie néphro-cholécystique.

By M. DE ABREU, del'Institut Brésilien de Sciences et de L'Académie de Médecine de Rio. Paris: Masson et Cie. Pp. 157. Fr.40.

THIS monograph contains only 23 pages of text, the rest of a considerable book being devoted to illustrative cases and a short résumé. The author has evolved an original technique for the differential diagnosis of renal and biliary stones, and other intra-abdominal shadows; he does not discuss the numerous methods already employed. In most cases this differential diagnosis is not a difficult one, but it must be admitted that there are cases which give rise to doubt. In these the author suggests that a profile view, with the X ray beam passing through the plane of the kidney from the pelvis to the posterior border will completely separate the shadows of the kidney (and any stones it may contain) from the shadow of the gall-bladder. This picture is, of course, through the maximum diameter of the kidney, and therefore should give a renal shadow of maximum density. The profile view of the kidney is obtained by rotating the patient on the couch to an angle of approximately 45 degrees, and the author claims that this position also frees the kidney shadow from that of the psoas muscle and air shadows in the bowel. The value of serial radiograms at 10 degrees of rotation is pointed out. Some 54 illustrative cases are included which are well reproduced, and help to support the author's contentions.

The book should prove of interest to all radiologists interested in urological diagnosis.

Procedure in Examination of the Lungs.

By ARTHUR F. KRAFTZER, M.D., Chief, Medical Department, New York Skin and Cancer Hospital. London: Humphrey Milford, Oxford University Press. 1930. Pp. 125. 8*s*. 6*d*.

THIS book is written as a practical manual for students. The author wisely insists on the importance of understanding the normal before trying to study physical signs in disease, and the student is told how to examine a normal chest and compare one area with another. The different signs and symptoms are then described, and the reader is warned to be methodical and not to take one striking sign, base a diagnosis on it, and build up other signs of doubtful

value to suit the diagnosis. Dr. Kraetzer considers the coin sound a detestable sign. A student given a case of pneumothorax may "get a fool hunch right at the start and look for the coin sound," thus avoiding the routine examination that should have led to the diagnosis. When dealing with tuberculosis the author gives much commonsense advice. The presence of serous effusion means tuberculosis, "unless you can disprove it, and the odds are a hundred to one you cannot."

The book is written in a very light and almost conversational style, but contains many valuable hints on the interpretation of signs and symptoms of pulmonary disease.

Elektrotherapie.

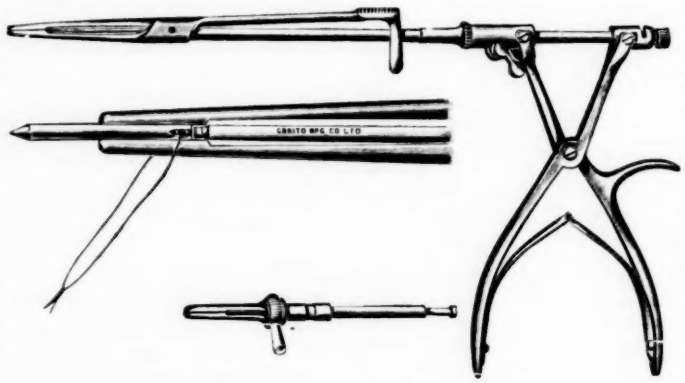
Third edition. By Dr. JOSEF KOWARSCHIK, Head of the Institute of Physical Therapeutics of the State Hospital, Vienna. Berlin: Julius Springer. Pp. 312. M.22.60.

THE second edition of this book was written six years ago. The present edition contains less electrotechnical detail, and the space thus saved has been utilised for the addition of the more recent advances in electrical treatment. The size of the book remains the same. The new material includes a brief account of the chronaxie and its possible uses in electrodiagnosis. In the section on diseases of the alimentary system there is a short description of the use of diathermy in some of the diseases of the gall-bladder; this form of treatment is recommended in cases of chronic inflammation, especially where there is painful spasm, and when adhesions are present. In the pages devoted to treatment of diseases of the skin the author describes the use of diathermy in place of the galvanic current for destroying superfluous hair follicles; and he comments favourably on the work of others in the treatment of keloid, X ray ulcers, and acrodermatitis atrophicans by diathermy. In selecting the diseases for which electrical methods of treatment can be recommended and in describing the results which may be anticipated, Dr. Kowarschik speaks with praiseworthy restraint. He might well have written more about electrical methods in diseases of women. Only four pages are devoted to this subject, and these are placed at the end of the section on diseases of the urogenital system. This short account is quite inadequate in view of the importance of the subject. A new expression, not familiar to English readers, is used for the treatment introduced by the late Prof. Bergonié. Just as the words "Franklinisation" and "d'Arsonvalisation" were introduced to describe certain forms of treatment by static electricity and by high-frequency currents, the expression "Bergonisation" has been coined to signify the treatment in which the muscles of the limbs and trunk are made synchronously to contract and do work. These are long words, but they serve to keep in memory the work of three very distinguished pioneers.

NEW INVENTIONS

A RADIUM NEEDLE INTRODUCER.

WHEN radium needles are being placed around and into malignant growths, much time can be saved and the work much simplified if each needle can be introduced and fully embedded in one act. The usual procedure is, of course, to enter the needle as far as the needle-holder permits and then to embed it by means of a special "pusher."



The object of the instrument here depicted is to do this in one instead of two movements. I designed it primarily for use with bladder and prostatic carcinoma; in these cases the work has to be done at the bottom of a cavity where visibility can only be obtained by constant swabbing, which unfortunately often dislodges the needles and yet is necessary if the pusher is to be fitted on to the needle. This instrument can, however, be used for implanting any needles into any growth to which direct access is possible. Needles of various thickness and length are easily put into the jaws of one or other of the holders, all of which fit on to the same handle. When using the instrument, the needle held in it is driven into the tissue by pushing, and then, whilst a firm pressure is maintained, the handle is closed, and thus the needle is propelled for the last part of its course and buried entirely beneath the growth's surface. In dealing with very dense tissues it is particularly important to maintain a very firm pressure whilst pushing, and thus to ensure that the point of the instrument is kept in close contact with the surface of the growth or skin overlying it.

The principle on which the instrument works can be seen from the detailed drawing; the pushing rod ends in a truncated cone which, on closing the handles, enters and slightly opens the jaws holding the needle and in the same movement forces it forwards.

The instrument has been carefully made for me by Mr. Schranz, of the Genito-Urinary Company. It consists of a handle and three extensions for work at various depths and adapted for various lengths of needles. There is also one very short extension for superficial work; only this latter and one longer are figured.

R. OGIER WARD, M.Ch. Oxf., F.R.C.S. Eng.,
Assistant Surgeon, St. Peter's Hospital; Surgeon in Charge, Genito-Urinary Department, Miller General Hospital.

THE LANCET.

LONDON: SATURDAY, JULY 26, 1930.

ANÆSTHETICS IN CHILDBIRTH.

THE appeals in the lay press for funds in order that every woman in hospital who desires it may have an anæsthetic to dull the pains of childbirth have stimulated public imagination, and expressions of medical opinion on this subject are being sought especially from obstetricians, anæsthetists, and general practitioners. In the current number of the *British Journal of Anæsthesia* a leading article is devoted to the question whether our maternity service would be improved by the provision of anæsthetics. The point of view adopted is that the present lack of such provision is mainly a financial question, but is also due to a "dormant obstetric conscience." Many women do not ask for an anæsthetic because they have no idea that labour pains can be alleviated without damage to themselves or to their child. As a matter of fact, quite apart from the humanitarian aspect of the question, the use of anæsthetics in labour has definite obstetric advantages. The memory of unrelieved pain in a first labour causes in many women grave apprehension of the coming ordeal in subsequent pregnancies—a quite unnecessary additional strain which does not conduce to the welfare of either mother or child. Again, if pain is duly relieved, and the patient's condition during labour gives no other cause for anxiety, doctors and relatives are likely to agree to let delivery be spontaneous, whereas if the woman is distressed it is common for the patient's friends to beg the doctor to force the pace by forceps delivery. The most marked advantage noticeable at the end of a labour which has been made painless is the absence of shock or exhaustion.

But if such relief from the pains of childbirth is to be given, certain safeguards are necessary. It is obvious that when the patient is under the influence of a drug and can make no complaint, more, and not less, systematic skilled obstetric observation is required if the progress of normal labour is to be distinguished from one in which difficulty is arising. A careful watch must be kept on the character of the pains and on the progress made; signs of exhaustion in the mother or of adverse effect on the child must be looked for, and this demands a skilled attendant with much time at his disposal and much patience. A real risk connected with the use of anæsthesia in labour assumed to be normal may arise from a desire to leave the mother's rest undisturbed, thus allowing danger signals to pass unnoticed. No difficulty occurs with those patients who can afford a long period of vigilant care from both accoucheur and anæsthetist; nor should it arise in maternity hospitals where sufficient personnel is available. There are, indeed, good reasons for hoping that the public will find generous support for the funds designed to enable anæsthetics to be given in lying-in hospitals. First, there is the fact that here, at least, one can provide relief of pain without increasing the danger; secondly, the medical student and midwife learning their jobs on anæsthetised patients are likely to retain the sympathetic outlook with which they enter hospital, and will not steel themselves deliberately to disregard cries and contortions of agony as inevitable accompaniments of the process of childbirth; thirdly, research will be stimulated, so that relief which is now feasible only inside the hospital walls will eventually be provided for women confined at home. How this blessing could be achieved will remain a problem at least until the present range of anæsthetics has been more thoroughly explored with this end in view, and probably until the range has been extended. The suggestion has been made that anæsthetists might themselves discuss the possibility or desirability of training in anæsthetics a certain number of midwives who are also fully qualified nurses. It is acknowledged that nurses have been successfully employed as anæsthetists in the United States, even for operations involving full surgical anæsthesia, but the best medical opinion in this country has always been opposed to the admission of anyone but a qualified doctor to the ranks of those allowed to give anæsthetics for any purpose whatsoever. It is obvious that the doctor who conducts a forceps case without the help of a colleague must entrust the administration of anæsthesia to the nurse, but he is in the room and in an emergency can, and often does, leave his obstetric operations to attend to the mask—sometimes to have to return to them without washing up. A very great improvement in the general education of the nurse-midwife would be required before the authorities could be asked seriously to discuss her training as an anæsthetist, and this possible solution must be dismissed as impracticable with the anæsthetics at present on the market.

There remains the hope that some new methods of analgesia in labour may be discovered. In our present issue Mr. J. S. M. CONNELL reports on his experience of the use of avertin in some 50 cases. He does not claim that the drug ensures a painless labour, but that by its use "it is possible to make things so easy for the patient that she has no devastating pain, no prolonged backache, no exhaustion and no memory of a terrible experience to jaundice her outlook on life." Admittedly the drug has drawbacks and dangers, and Mr. CONNELL suggests only that it is worthy of trial by the practitioner. If this is so, it is also worthy of inclusion among the drugs being tested by Mr.

ALECK BOURNE and Dr. J. H. BURN for their action on the human uterus.[1] A simple apparatus for recording graphically the changes in the uterine pressure taking place during labour has enabled them to show the effect on the behaviour of the uterus of chloroform, ether, nitrous oxide, stovaine, morphine, atropine, and quinine. Their conclusions are that: (*a*) The administration of chloroform or ether on an open mask at once arrests the contractions in the first stage, and diminishes their force and frequency in the second stage. The effect comes on rapidly, and passes off rapidly when the administration is discontinued. (*b*) The administration of gas and oxygen has no effect on the contractions during labour. (*c*) Stovaine (intraspinal) does not inhibit the contractions, but interferes with full relaxation between the pains. This appears to be due to continuous contraction of the lower segment, and if stovaine be given early in the first stage dilatation will be delayed. (*d*) Morphine lessens the frequency of uterine contractions, but the pains pass off more slowly, so that the work done by the uterus is probably as great as or greater than before, despite the lessened frequency. (*e*) Atropine appears to stimulate the contractions of the uterus. It certainly has no inhibitory action. (*f*) The stimulant action of quinine during labour is very small. The most important of these conclusions from the point of view of those who are eager to secure painless labour for women in lying-in hospitals is that which acquits gas and oxygen of any deleterious effect on the contractions of the uterus. The apparatus is cumbersome, the administration requires experience and skill, and the depth of anæsthesia attainable may not suffice to make the actual delivery painless. But the very fact that one form of anæsthesia has been proved to cause no delay in parturition will encourage the search for others equally harmless which can be more easily administered. The pioneer work of Mr. BOURNE and Dr. BURN has initiated a new and valuable method of approach.

SURGICAL BIOGRAPHY.

THERE has just been published an alphabetical series of biographies of the Fellows of the Royal College of Surgeons of England covering the period from the institution of the order of Fellows in 1843 down to 1922, when VICTOR PLARR, their author, died after a short illness. PLARR, it will be remembered, was librarian of the College for over 30 years and these important volumes[2] form a fitting testimonial to his industry as well as to his literary capacity. That there should be published by the College a biographical record of its Fellows was proposed originally in 1912 by Sir JOHN BLAND-SUTTON, and again when he became President of the College, knowing that PLARR had already started on the work. The obituary notices which had appeared in THE LANCET were, in the initial stage, PLARR'S inspiration, as he frankly said, while at that time the question of money precluded the College from publication, although PLARR continued to add to his notes. But recently the Council of the College, under LORD MOYNIHAN'S Presidency, invited Mr. D'ARCY POWER, Mr. W. G. SPENCER, and Prof. GASK, who had been members of the Library Committee of the College, to revise and prepare PLARR'S M.S. for printing and publication, since when other sources of information have been drawn upon. The cost of issue has been defrayed from a legacy of £5000 made to the College by the late Mr. THELWALL THOMAS, and the volumes for this reason bear the name of that well-known surgeon and generous man.

The lives of the Fellows form a valuable record of the progress of surgery at the hands of its best known exponents during the past 90 years: the appellation "best known" can be justified on the law of averages, and does not suggest that the Fellows of the other Royal Colleges have not produced corresponding leaders of their art, many of whom incidentally fall for mention in the English series. By the publication of these biographies the period of some 90 years of surgical history is bridged over, and largely by the solid construction of contemporary recollection, for here we find set down many things known personally, and few things that have not been received by their retailers at first or second hand. This position has, of course, its drawbacks as well as its advantages, for it is thus inevitable that the note of the work should be one of eulogy. How could it be otherwise when the main source of information has been the biographies published in the medical press during the week of the demise, while in many instances relatives, perhaps quite near relatives, of the dead man will still be living? In certain instances the monotonous note of appreciation detracts from the value of the compilation, omissions made from delicacy marring the accuracy of the record, but it is good to know that these reservations are not to be deplored in the case of anyone who really counts in the history of his science. The disregard for proportion in the length of the obituaries would, again, be an easy matter to criticise, but much interesting reading is due to this very absence of symmetry, for some of the longer obituaries owe their length not so much to the eminent professional position of their subjects as to the accident of association with some notable circumstances outside the profession.

It is intended to issue supplementary volumes every ten years, and it will be advisable that these should contain revisions as well as additions. It will be of real use to the writers of medical history if those who have access to information which would enable some of the more meagre entries to be supplemented would communicate with the Librarian of the College, and would clothe certain skeletons with their appropriate tissues. The period over which retrospection has to extend is so brief that it seems probable that there lies to hand much of the necessary information.

[1] Brit. Med. Jour., July 19th, 1930, p. 87.

[2] Thelwall Thomas Memorial: Plarr's Lives of the Fellows of the Royal College of Surgeons of England. Bristol: John Wright and Sons; London: Simpkin Marshall, Ltd. 1930. Two vols., pp. 752 and 596. Price, 42*s.* cloth; 57*s.* 6*d.* half bound.

A GENERAL MEDICAL SERVICE.

THE possibility of a State medical service with its attendant bureaucratic control has begun to haunt the medical profession of recent years. Whether or not this spectral presence has moved the British Medical Association directly to draw up a scheme for a general medical service, it has certainly had a definite and material influence in the matter; for it is with the sentiment that offence is the truest defence that some constructive proposals have come from the Council of the Association. If the State should extend the scope of clinics and centres, and further absorb the work still carried on by the general practitioner, it is clearly desirable that the medical profession should be able to offer some basis for a scheme in accordance with its own views and traditions, things which State organisation might disregard.

The details of any such scheme will necessarily call for close scrutiny and wide discussion before actual trial, while modification after the scheme has been put into practice—if ever—may be needed; but the Representative Meeting of the Association indicated accurately the possible reactions of the general practitioner to certain of the Council's proposals, and in so doing has also informed the public of much that matters. The position of the medical officer of health in the scheme was the subject of much debate. The proposal of the Council that he should act as liaison officer between the local general practitioner and the local authority was challenged by Dr. E. R. FOTHERGILL, on the grounds that it was possible that not all medical officers of health were in perfect accord with the general practitioners in their district. This is an old story, and, as far as we know, it has received no new support from actual events, but Dr. H. J. MILBANK-SMITH advocated the formation of a statutory medical committee for the area to consult with the medical officers of health on matters affecting the local practitioners. The proposal to form such a committee was inspired by the feeling that the M.O.H. would probably meet the local authorities only three or four times in the year, and yet would be in a position to make decisions affecting the welfare of local practitioners in which they could have no dissentient voice. The opposite point of view was put very ably by Dr. J. MIDDLETON MARTIN, who felt the interests of the profession to be a concern which the medical officer of health would have at heart; he spoke feelingly of the difficulties of administration cumbered by too many opinions, and rather gave the impression that medical officers of health were guardian angels brooding over the welfare of practitioners in their area. Dr. D. O. TWINING's conception of them was rather different and he classified them either as Mussolinis or mice; but, like Dr. FOTHERGILL, he felt disinclined to confide the welfare of the general practitioner to either group. The meeting agreed that the local medical advisory committee should have direct access to the local authority without the intervention of these third parties.

In his introductory speech Dr. BONE made it clear that the financial aspect had been purposely excluded from the proposals, but it was felt that these would be incomplete without some tentative reference to the probable cost of the scheme. In a separate section of the proposals this has been attempted in figures on a basis of calculations made by the Royal Commission on National Health Insurance of 1926, and the following figures are quoted from that reference: the cost of extension of the present National Health Insurance Scheme to dependents of insured persons (£9,500,000); a consultant and specialist service for present insured persons (£1,290,000); laboratory aids for present insured persons (£100,000); making a total of £10,890,000. The British Medical Association's estimate of the cost of its Maternity Scheme was approximately £2,250,000. Against these figures are certain "set-offs," notably the whole cost of the present additional treatment benefits given under the National Health Insurance. The amount spent in this way in 1928–29 in England alone was £3,622,869. As Dr. J. W. E. CORY pointed out at the meeting these figures are by now somewhat out of date and their deletion from the proposals was considered. It was felt, however, that in being asked to discuss any scheme of this kind the public should be given some idea of the cost even if it could not be assessed with complete accuracy, and the meeting decided to retain these paragraphs as they stood.

The proposals as a whole make a basis for a complete scheme which, considering its extent, should not prove unduly costly if the financial estimates are at all sound. The London Public Medical Service, now in action in Kensington and Paddington, forms an interesting practical experiment of the application of such a scheme on a small scale. Part of a motion containing a reference to it was ruled out of order by the chair in the position in which it was introduced, but some further reference will doubtless be made to it in the course of the meeting. The Council's proposals cover a wide field and make provision for all classes of patients, including the indigent. Only experiment can prove the value of the scheme as a practical measure.

THE OSLER CLUB.—The Osler Club celebrated on Saturday, July 12th, the eighty-first anniversary of the birthday of Sir William Osler. Prof. Harvey Cushing, having been welcomed as a "Friend of the Club," gave an informal oration in which the charm and whimsicality of Osler's personality was well brought out. He told of the early Western days, of Father Johnson and of James Bovell, and of how, under their influence, Osler turned from the church to medicine. He also let his audience into the method employed in writing his great life of his friend and master. Dr. Arnold Klebs, Sir Arthur Keith, Sir D'Arcy Power, Dr. Henry Wellcome, and Mr. Philip Franklin then entered on a lively discussion of Osler as physician, author, and man, until Mr. W. R. Bett remembered that it was "long past Osler's bedtime," and wound up the proceedings with a tribute to the influence of Cushing's "Life of Osler" upon the later generations of medical men. Before the oration the club entertained Prof. Cushing to dinner at the Langham Hotel.

ANNOTATIONS

THE TRAFFIC IN DANGEROUS DRUGS.

THE tenth assembly of the League of Nations last year approved the principle of limiting the manufacture of dangerous drugs as foreshadowed in The Hague Convention of 1912. The council of the League, last May, at its fifty-ninth session, approved a plan which is to be submitted to an international conference to be held next December. Meanwhile the recent issue of a report for the year 1929 by the British Government shows how by the Dangerous Drugs Acts 1920–25 illicit traffic has been brought under control in this country. While seizures of contraband have been relatively few and far between in Great Britain, reports from the Dominions and Colonies and from several foreign countries afford disquieting evidence of widespread illicit traffic abroad. International coöperation, as contemplated by The Hague and Geneva Opium Conventions, has not been effective, and indeed some important countries have not even troubled to reply to letters addressed to them. Nevertheless, it is satisfactory to learn that the exports of British-made morphine and its salts, which some years ago amounted to tons, last year totalled 42,331 ounces, a decrease of 7492 ounces on the previous year. The consignment to France was nearly 5000 ounces less than in 1928. Three-fourths of the raw opium imported for medicinal purposes now comes from India and only about one-fourth from Turkey, while Persian opium has practically ceased to be employed. The report states that "as prepared opium (i.e., opium for smoking) is totally prohibited in Great Britain, all quantities seized are destroyed" and "active police measures are taken to detect infringements of the law." Such commendable vigilance here contrasts with the continued exports from India of "prepared opium" for smoking purposes, yielding a not inconsiderable revenue to the Government. In 1928 cocaine was for the first time manufactured under licence in this country, and in 1929, 9326 ounces were so manufactured against 4934 ounces in the previous year, the imports of the alkaloid showing a corresponding decline.

It would be well if all the high contracting parties to The Hague and Geneva Opium Conventions would furnish as precise and satisfactory reports as that just issued by the British Government. Official statements from the League of Nations, however, bear witness to the widespread and dangerous extent of the illicit traffic in opium, morphine, heroin, and cocaine, as well as to the ingenuity and resource of the organisation for this clandestine commerce. The advisory committee on opium at Geneva, which has been labouring for the last ten years, is to have an infusion of new membership, while the Permanent Central Opium Board has, in the five sessions it has held, found it difficult to compile statistics of illicit traffic owing to the failure of producing countries to furnish complete returns. No machinery which can be contrived to grapple with this complex problem will be effective unless and until the nations, which have solemnly pledged themselves to effectuate treaties, enact and enforce the legislation which such treaties imply.

HEALTHY SLEEP.

IT is an ancient jest about the disagreement of doctors that their advice on the best position in which to sleep is so positive, and at the same time so various, that the only thing to do is to remain stark, staring, wide awake. This is no libel, for in actual fact three American doctors have found in the literature vigorous reasoned advice against sleeping in every possible position. Some postures are said to produce deformities and other to correct them, and every posture in turn is accused of interfering with the action of the heart, stomach, or respiration.[1] The United States army urges its soldiers never to forget that "the best way to use the body for all purposes is as if it were stretched up as tall as possible"; during sleep they are not to "curl up and buckle" in the middle. Yet other authorities recommend a curled-up position, and this at least seems more reasonable, since the "position of rest" for all parts of the body is one of flexion, following the rule that the flexor muscles are slightly more powerful than the extensor.

Where such differences exist it is obvious that someone has based an opinion on inadequate evidence. It is easy enough for the physician to notice that two or three patients with a certain disease state that they always sleep in a certain position, but to give the position an ætiological importance on these grounds is unjustified. There are two fallacies: one is the lack of adequate control experiment and the insufficiency of numbers, and the other is the fact that the patient's statement is worth very little without the corroboration of an observer. The American workers, during the course of an investigation into sleep conducted at the Melion Institute, Pittsburg, have invented an ingenious device to record the movements of healthy people in bed. A pen is attached to a part of the bed which yields to the sleeper's movements when he changes the position of a limb or of the body. The pen writes on a strip of moving paper, which also records the passage of time, and each jag in the line represents a movement. A study of 112 healthy people and 70 patients in hospital, and in addition of some children and university men, has shown that the average healthy sleeper changes his position between 20 and 45 times in a typical night of eight hours, and holds about half the positions he takes up for less that five minutes. He does not lie still for an hour at a time once in the night. "Log-like" slumber was only produced by heavy doses of opiates. An extension of the recording device included a cinematograph camera which automatically took the position of the sleeper each time he stirred and ceased to stir. The paper is illustrated with 33 sketches showing the corresponding number of different positions taken up by a typical sleeper, together with a clock showing the times at which he moves. If the bed is comfortable for all positions the sleeper turns through about a dozen gross positions with minor variations in a fairly regular sequence throughout the night. Those that are maintained for fairly long periods are invariably contorted; the spine is always curved laterally and usually bowed backwards and twisted. Even when he lies on his back he does not lie flat, but places one leg in such a way

[1] Johnson, H. M., Swan, T. H., and Weigand, G. E.: Jour. Amer. Med. Soc. Assoc., 1930, xciv., 2058.

as to prevent rotation and throw more of the weight on to the other side. The posture that requires least effort to maintain is a prone one.

The conclusion is that any healthy sleeper would have to be strapped in a frame or moulded in a cast if he were to spend the entire night in the position recommended by any one physician; on the other hand, he contrives to please all of them at some time or another. Just as the best diet for a healthy person is to eat what he likes, so the best posture for healthy sleep is a series of changes as dictated by nature. No one of the positions adopted gives the "complete relaxation" shown in a fainting person, but each relieves the irritation and corrects the errors of the previous position and of the day's activities.

TRANSMISSION OF MATERNAL IMMUNITY.

CHICKENS in the egg and new-born rabbits have very little power of producing antibodies in response to stimulation by a foreign antigen, and it may be assumed that the fœtus in utero is in at least as disadvantageous a position. In man and other animals (monkeys and rodents), in which the placenta is permeable to antibodies, the young one comes into the world already charged with the products of its mother's antibody responses, and is in a good state to resist the attacks of microbes which immediately are made upon it. New-born babies give a negative Schick test—i.e., have diphtheria antitoxin in their blood—about as frequently as adults; about three-quarters of them are protected against diphtheria. As time goes on this dose of maternal antitoxin wears off, and at a year old only about one-quarter of the children will be found Schick negative, and they have to set to work to learn to produce their own antitoxin as they come in personal contact with the diphtheria bacillus. The protection of new-born children against diphtheria or tetanus would be more complete than it is if their mothers were immunised with toxoid during pregnancy, which would not be an unreasonable thing to do. But in other animals, and notably in ruminants, the placenta is thicker and does not allow antibodies to pass from mother to fœtus; the young reach the world entirely without protection, and this may have most disastrous results, as in the "lamb dysentery," which sometimes kills a third of the produce of a flock. Theobald Smith showed some time ago that calves reached the world in this unprotected state and that if they were denied all access to their mother were very likely to perish from a general infection with *Bacillus coli* from their intestines. He found further that they were protected if they sucked their mothers' milk, or if they were given by hand a dose of her colostrum or indeed a dose of her blood. Maternal immunity in the cow is, therefore, transmitted through the colostrum and not across the placenta. The brilliant work of Mr. T. Dalling and his co-workers at the Wellcome Laboratories at Beckenham, the latest phase of which is described in the current number of the *Journal of Pathology and Bacteriology* (vol. xxxiii., p. 783), shows that the same holds for the sheep. Lamb dysentery, as they have shown, is due to a bacillus closely allied to, but apparently not identical with, Welch's bacillus of gas gangrene. It may be prevented by dosing each lamb as it is born with the appropriate antitoxin from an immunised horse, but as may be imagined this is not a convenient or even a practicable thing to do under the conditions which prevail at lambing time in the north of England and south of Scotland, where the disease is particularly prevalent. Equally good results are obtained more easily by immunising the ewes with toxin-antitoxin mixtures at leisure during pregnancy. It is now shown conclusively that the maternal antitoxin passes to the lamb via the colostrum, in which antitoxin reaches a higher concentration than in the ewe's blood for a few days after delivery. It is well-known that antitoxin given by the mouth is ordinarily useless, and that it is destroyed in the processes of digestion. But this, remarkably enough, does not apply to the lamb for about the first three days of its life; during that time horse antitoxin given by the mouth is absorbed and can be demonstrated in the blood; from about the fourth day onwards the alimentary tract is impermeable. Other experiments show that the new-born puppy and foal have the same convenient capacity of absorbing antitoxin given by mouth; the new-born baby seems to have it only to a trivial degree. The whole is an excellent illustration of the predominance of ends over means in determining the behaviour of animals. One way or another all species reach the same end, and the new-born young is furnished with maternal antibodies; animals with thin placentas put it in during pregnancy, those with thick placentas through the colostrum immediately after birth.

THE VITALITY OF ENAMEL.

ABOUT two years ago Sprawson and Bury[1] reported that analyses of human enamel revealed a constant though small amount of organic matter. The delicate methods employed made it certain that enamel is not entirely inorganic and the earlier work of Sir Charles Tomes was thus confirmed. Whether enamel is a vital tissue which can undergo constructive change after eruption is a question much debated. One school holds that it is within the pale of nutrition and thus subject to metabolism in the same way as bone. The other denies the possibility of any alteration after it has once been formed. Most of the evidence for and against these views has been based on histological and staining appearances, but clearly the first necessity was for analysis by methods chemically beyond reproach. Hence the significance of Sprawson and Bury's observations, and Mr. Sprawson has now followed them up by studying the microscopic structure of marsupial and human enamel.[2] He finds that enamel can readily be penetrated by stains from the pulp cavity; the stain does not extend through the whole thickness of the enamel but for a distance depending largely on the age of the tooth. Since the stain can only reach the enamel via the dentinal tubes, which are definitely known to contain protoplasm, it seems a reasonable inference that its passage into enamel depends also on spaces which are not artefacts but part of the normal structure, and, like the spaces in dentine, filled during life with lymph. The tubes in marsupial enamel lie between the enamel prisms, as previously shown by Mummery and von Ebner. Sprawson finds that the patency of the tubes varies with age and that they are more permeable in young animals. As age advances the enamel becomes more highly calcified, by deposition of calcium salts in the interprismatic spaces. This reaction implies nutritional processes in the enamel, since only in this way could the density of the tissue increase. Similar staining reactions

[1] Sprawson, E., and Bury, F. W.: Proc. Roy. Soc., B., 1928 cii., 419; see THE LANCET, 1928, ii., 610.

[2] Proc. Roy. Soc., B., 1930, cvi.

have been noted by others, but under conditions which did not entirely preclude the penetration of stain through cracks artificially produced. But the regularity of the phenomena now described by Sprawson and the large number of teeth examined seem to leave little doubt that enamel is a vital tissue in which an exchange of calcium salts takes place. He shows incidentally that cracks in the enamel are common and are probably due to the trauma of mastication. When these cracks occur the enamel and dentine in the vicinity react; the dentine tubes and the interprismatic spaces in the enamel first enlarge and then become hypercalcified. Thus a crack which is at first a definite solution of continuity may be so completely healed as to leave only a linear scar.

Although Mr. Sprawson's paper is primarily a study of marsupial enamel, he reproduces five sections which leave little doubt that the observations apply also to human enamel. He marshalls his arguments with exemplary caution, and the illustrative photomicrographs are beautiful.

VEGETARIANISM AND BLOOD PRESSURE.

THE relation between dietetic habits and raised blood pressure is not likely to be a simple one of cause and effect, though excess of food of animal origin, and especially of meat, is often held to favour hyperpiesis. Enough records seem to have been made of men who, on the one hand, have eaten a great deal of such foods without developing any rise in blood pressure and, on the other hand, of men who have high blood pressures in spite of abstemiousness in this respect, to make it certain that other factors play a determining part. It might still be true, nevertheless, that meat-eating in conjunction with other factors makes a person relatively liable to increased blood pressure, and this is the thesis suggested by Dr. Felix Saile [1] as the result of a series of observations carried out during the past two years. He chose for his subject 110 monks belonging to the Trappist, Carmelite, and Carthusian orders, whose rules forbid the use of meat, fish, eggs, and butter, and as controls he employed 115 monks from the Dominican and Franciscan orders, who are permitted to eat meat four and five times a week respectively. The mean blood pressure of the vegetarians was considerably lower than that of the controls at all ages from 20 to 90. The difference was greatest in the age-group 60 to 70, where the mean for the vegetarians was 120 mm. Hg, and for the meat eaters 160 mm. Hg. Interesting as such observations are, they cannot be considered conclusive, a fact which is recognised by Saile himself. The general rules of life differ widely in the two sets of orders. The Trappists, Carmelites, and Carthusians are under a vow of silence, and live secluded lives devoted largely to manual work, or to study and contemplation, as the case may be. The Benedictines and Franciscans, on the other hand, come into closer contact with one another and with the outside world, and live what ordinary folk would consider a much more normal life. It remains yet to be proved, therefore, that the diet of the two groups of orders was the primary factor determining the difference in the average height of their blood pressure.

[1] Med. Klin., Nr. 25, June 20th, 1930.

TUBERCLE BACILLI IN THE BLOOD.

THE final positive diagnosis of tuberculosis rests almost entirely upon bacteriological evidence, and accordingly it has become the practice to examine any or all of the excretions in the hopes of finding the organism. According to R. Russew,[1] examination of the blood itself with this object was first carried out successfully by Villemin, and since his original observation it has been generally accepted that bacilli can be recovered in cases of severe miliary tubercle. In the type of disease for which Landouzy coined the word "typhobacillose" it is likewise supposed that tubercle bacilli are swarming in the blood stream, but here the infection is too massive and virulent to permit of tubercle formation and a true bacillæmia leads to death. The conception of tubercle bacilli in the blood in these acute cases is readily acceptable, and of greater interest are Russew's results in much less acute cases and in so-called surgical tuberculosis. The method he employs is that devised by Prof. Löwenstein, in whose clinic in Vienna the work has been done, and it is to strict attention to detail that he attributes his success. Tubercle bacilli were discovered in the blood of six out of seventeen patients with pulmonary tuberculosis and some of the positive results were cases where the temperature was normal or subfebrile. The association of bacillæmia with a good general state is strikingly demonstrated in the cases of surgical tuberculosis. Here, in a group of eight patients, six had tubercle bacilli in the blood and yet were free from fever and in a good general state of health. Russew's work suggests that tubercle bacilli are recoverable from the blood more often than is generally recognised and that this bacillæmia does not necessarily mean a fatal prognosis. If surgical tuberculosis is accompanied by bacillæmia the possible excretion of tubercle bacilli by such patients has to be considered, and this has an important bearing on their infectivity. Another deduction would be that in cases of long-continued pyrexia of unknown origin a blood culture should be done by Löwenstein's method.

HYPOGLYCÆMIA AND SUPRARENAL TUMOUR.

CLINICIANS are now familiar with the distinctive train of symptoms which is provoked by an overdose of insulin. The analogy offered by other endocrine glands suggested the possible existence of a condition of spontaneous hypoglycæmia and led to the discovery of the rare condition now known as hyperinsulinism, the pathological basis of which is hyperplasia of the islet cells of the pancreas. Hypoglycæmia of lesser degree has been observed in other conditions such as Addison's disease and acute necrosis of the liver. Again, the hunger, intense muscular weakness, and tremor which often follow prolonged muscular exercise in a fasting subject, are symptoms suggestive of hypoglycæmia and are quickly relieved by sugar. Certain cases of adiposity associated with excessive craving for sweet food are also capable of the same explanation.

H. B. Anderson[2] records a case of hypoglycæmia associated with a tumour of the suprarenal body.

The patient was a man of 33, admitted to hospital in a state of coma, from which he could with difficulty be roused. He was very restless and perspired freely.

After intravenous injection of 60 grammes of glucose he quickly regained consciousness. On leaving hospital he remained well except for attacks of uncontrollable temper.

[1] Wien. Archiv f. Inn. Med., 1930, xx., 231.
[2] Amer. Jour. Med. Sci., July, 1930, p. 71.

Later he was readmitted in coma and could not be revived by glucose. His blood-sugar varied between 0·04 per cent. and 0·08 per cent. Post mortem an encapsulated tumour, apparently a cortical carcinoma, replaced the left suprarenal and the right suprarenal was smaller than usual. The pancreas was normal, apart from some vascular congestion towards the tail.

It is clear that hypoglycæmia played a large part in causing the symptoms in this case. Hypoglycæmia is not surprising in a lesion of the suprarenal capsule in view of the opposite effects exerted on the blood-sugar by insulin and adrenalin. It cannot, however, explain the patient's death, for although it was recognised early intravenous injection of glucose failed to save the patient. Evidently some more important factor, probably destruction of the cortical suprarenal tissue, which is known to be essential to life, was concerned.

CYCLICAL VOMITING.

BIOCHEMICAL research has thrown much light on periodic attacks of sickness in childhood, and the associated "acidosis" has been widely studied. The condition is fairly well defined. The attacks may begin early, usually in nervous children, and sometimes recur with remarkable regularity, the child being apparently well in the intervals. The onset may be sudden, but is often preceded by a day or two's malaise, irritability, and, commonly, constipation; during this time acetone bodies may be detected in the urine. Vomiting is at first severe; it may persist for hours or days, and be associated with profound collapse, but recovery is rapid, and death in an attack is almost unknown. Many attempts have been made to account for the periodic nature of the disorder, and the good health of the patients between the attacks. Some observers regard the vomiting as a form of childish biliousness, allied to the "bilious attacks" or migraine of adults, and there is no doubt that such children not infrequently develop typical migraine in later life, while a hereditary factor unquestionably plays a part in both conditions. Others look on cyclical vomiting as merely a general reaction to a simple gastro-intestinal "upset"; but although dietetic errors and constipation can often be found before an attack, it is hard to believe that these can be wholly responsible. A third body of opinion regards the condition as an allergic reaction, comparable in ætiology to asthma and hay-fever, and due to protein sensitisation; whilst some look upon it as a form of juvenile "hysteria." The view most widely held, however, is that the condition is essentially metabolic in origin, and there is much to support this theory. The constant presence of ketone bodies in the urine points to disordered metabolism both of fat and carbohydrate. The ketosis may be intense, and is almost always associated with some degree of hypoglycæmia. During an attack the blood-sugar has been found as low as 37 mg. per cent., and amounts of oxybutyric acid as high as 5 g. a day have been noted in the urine. Often there is a greatly increased excretion of urea, and sometimes there are large numbers of casts, comparable to those found in the acidosis of diabetic coma. Little exact information is available about the condition of blood apart from its sugar content, but no marked changes have been found in the reaction, or in the percentage of creatinine or fat. There are also few reports on the frequency of intestinal intoxication, and the output of such substances as indican in the urine during the attacks. A reduction of blood-sugar appears, however, to be almost constant, and H. C. Cameron and others have been led from this to lay much emphasis on the hypoglycæmia of the "nervous child." It is clearly important, therefore, to determine if possible how far the subject of cyclical vomiting is abnormal between attacks, and in his response to stimuli that may be expected to call them forth. Among these stimuli may be mentioned dietetic errors—especially an excess of fat or sudden limitation of carbohydrate—severe physical exertion, and emotional influences. L. Salomonsen, of Oslo, reports [1] that he has examined a number of normal children with this object, and his results are interesting. In 15 healthy infants between 1 and 4 years old, subjected to complete starvation for 48 hours, the blood-sugar fell to between 31 and 70 mg. per cent., whilst the blood acetone and blood fatty acid values rose considerably; in 9 a large number of casts appeared in the urine. In 12 healthy children, aged 5 to 14 years, a sudden change to an excess of fat in the diet led to symptoms closely resembling those of cyclical vomiting, but of very variable intensity, which reached a maximum after two to five days of the high fat diet. Chance febrile attacks during such "alimentary acidosis" in healthy children greatly increased the ketonuria. Six children who suffered from cyclical vomiting showed no difference, in response to precisely similar changes in diet, from those seen in the normal children. There was thus no indication that such children are in any metabolic respect different from healthy children, and Salomonsen concludes that there is no evidence that cyclical vomiting is a "metabolic disorder." It is, he thinks, an entirely physiological response, exactly analogous to what can be artificially produced in healthy children by sudden restriction of carbohydrate. The precise cause which leads to the onset of an attack he leaves undecided.

USE OF THE LEFT HAND.

A hundred and fifty years ago Benjamin Franklin published "The Petition of the Left Hand," urging the use of that neglected member to aid and relieve its fellow. Since then we have learnt a great deal about the treatment of left-handed children, who are no longer scolded into neurosis for using the hand which comes natural to them. The majority who are right-handed, however, seldom do anything to encourage the use of the left hand, and in the French Academy of Medicine on July 8th Dr. Armaingaud appealed for a wider recognition of the value of ambi-dexterity.[2] The experience of men who lost their right hands in war service has shown how successfully the left hand can be trained, and the advantage of being able to use either hand as occasion demands is obvious. Dr. Armaingaud mentioned the value of ambidexterity to surgeons, and senior members of the Ophthalmological Society will recall the way in which Critchett could remove the lens of the right eye with the right hand and the lens of the left eye with the left hand at a single operation. Dr. Armaingaud frankly characterised right-handedness as an "invalidité artificielle," and he so far impressed the members of the Academy that the subject was referred to a committee for consideration.

WE regret to announce the death at Torquay, in his eighty-eighth year, of Dr. Thomas Outterson Wood, well known in connexion with psychiatric work. We hope to publish an account of his long and valuable career.

[1] Acta Pædiatrica, 1929, ix., Suppl. 1.
[2] Bull de l'Acad. de Méd., 1930, civ., 48.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCIII.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.*

PART I.

PULMONARY tuberculosis, as seen in the adult, is rarely a primary infection; it is a reinfection. The body has already acquired a degree of immunity which means that the organisms find themselves in an environment, in a measure prepared to resist them. In those cases in which the primary invasion has produced but a low grade of immunity, and, at the reinfection, large quantities of tubercle bacilli are disseminated in the lungs, there is rapid spread of the disease, which is extremely difficult or impossible to control. On the other hand, the resistance may be completely effective, or it may be partially so only, and, as a result, one finds in the lung caseation, fibrosis, and cavitation. Here we are chiefly concerned with:—

(*a*) The cases in which the resistance of the individual, even when fostered and assisted by sanatorium treatment and hygiene directed to the improvement of the general health, fails to prove efficient. This may be because the tubercle bacilli have had too long a start, or because their relative potency to the resistance is too strong, or the individual's resistance is not overcoming the tubercle bacilli sufficiently fast, the time factor being of importance.

(*b*) The cases of chronic or fibroid phthisis, in which the pathological fibroid tissue which has formed, while beneficial in checking the too rapid advance of the tubercle bacilli, becomes in turn detrimental to the lungs. This fibroid tissue is continually shrinking and so diminishing the volume of the lung. Some compensation is possible by the falling in of the chest wall, the displacement of the mediastinum, and the compensatory emphysema of the healthier parts of the lungs. This, however, does not prevent the deleterious influence of the fibrosis on the bronchi and bronchioles, which gradually become dilated and hypertrophied, so that a condition of secondary bronchiectasis with retention of secretions and toxæmia develops.

(*c*) Cases with cavities too large, or with walls too well defined to heal under medical treatment. These cavities, in addition to being responsible for continued toxæmia, are dangerous as potential sources of severe hæmoptysis.

(*d*) Cases of serious, long and continued or recurring hæmorrhages, whether they come in the previous category or not.

Surgery, in the treatment of pulmonary tuberculosis, is not the performance of a radical operation producing a cure, and needing but the healing of the wound and convalescence. It is an adjunct to medical treatment, aimed to overcome those obstacles which are causing sanatorium treatment alone to fail, and designed to readjust the anatomical, physiological and pathological intrathoracic balance, so that sanatorium treatment can play its part without an overwhelming antagonistic handicap.

The objects of surgery are to rest the lung, to remove the tension and distortion strain of the pathological fibrous tissue formation, to abolish abnormal cavities whether in the lung parenchyma, due to dilatation of the bronchi, or in the pleural cavity; finally, to prevent the recurrence of hæmorrhages. All these objects are obtained by one means only—the collapse of the lung; it is the manner of procuring this collapse that differs according to the circumstances of the case.

The surgical methods available for obtaining these ends are artificial pneumothorax, oleothorax, phrenic evulsion, extrapleural pneumolysis, thoracoplasty, and multiple neurectomy. Some of these collapse, to a great or less extent, the whole lung, others are entirely or mainly local in their action.

Artificial Pneumothorax.

The lung is separated from the chest wall by the pleural sac in which there is normally a negative pressure equal to about 6 mm. of Hg. If this pleural sac is filled with air until the intra- and extra-pleural pressures are both at atmospheric pressure or zero, the normal lung will collapse completely by virtue of its elasticity. This is the result aimed at when an artificial pneumothorax is done for disease. Its realisation, however, often fails. One reason for failure is that a lung extensively fibrosed, or with thick-walled cavities, or containing areas of consolidation is incapable of such complete collapse, even if the intrapleural pressure is raised above zero. An excessively mobile mediastinum may be another cause for failure in that, even before the intrapleural pressure is zero the mediastinum becomes displaced to the opposite side and, pressing on that lung, embarrasses its ventilation and the oxygenation of the blood. This can sometimes be checked by the introduction of gomenol oil. A far more frequent and serious difficulty in the production of a successful pneumothorax is the presence of adhesions between the two layers of the pleural membranes. These, holding out the lung, prevent a collapse sufficient to be of any value in 40 per cent. of the cases attempted, and interfere with complete or reasonably complete collapse in 20 per cent.

Artificial pneumothorax, when it produces complete or almost complete collapse of the lung, either without the necessity of dividing adhesions or after the division of these, is one of the most successful methods of treatment for pulmonary tuberculosis. In most of these cases the benefit becomes almost immediately apparent by the reduction in temperature, the improvement in the pulse-rate, the diminution of cough and sputum, and the lessening of dyspnœa. The reduction in the toxæmia is responsible for great benefit in the general condition and a gain in weight. In the very earliest stages there is often increase of cough and sputum and loss of weight, but these are temporary only.

The results of Matson, Matson and Bisaillon in 600 cases were as follows:—

—	Cases	Clinically well.	Arrested.	Dead.
		Per cent.		
Satisfactory compression	235	48·5	18·7	22·0
Partial compression	245	11·4	11·8	58·0
No free pleural space	120	5·8	9·2	66·6

CONTRA-INDICATIONS.

The contra-indications to artificial pneumothorax treatment, apart from failing heart, nephritis and extensive tuberculous enteritis, are based on the anatomical extent of the disease in the opposite lung. If there is only slight root involvement, not interfering too greatly with air entry, or a localised lesion of a lobe, it is justifiable to attempt a complete pneumothorax on the more affected side. If the better lung

* The substance of this article was communicated to the Congress of the Royal Institute of Public Health held in Portsmouth in June, 1930. Part II. will appear next week.

has, however, more extensive disease than that just indicated, it is wiser to aim at a partial pneumothorax. Under these circumstances it is particularly advantageous if a "selective collapse" can be obtained—i.e., collapse more or less localised to that area chiefly affected by disease. In certain cases with simultaneous bilateral active disease it may be necessary to establish a bilateral pneumothorax, that on the less involved side being started as soon as the first is satisfactorily established. Bilateral pneumothorax is also done in cases in which, the one lung being under control, the disease later spreads in the other. In either case the pneumothorax is, of course, partial only, and great care is required so to control the total collapse that too great a strain is not placed on the heart.

It may be as well here to emphasise once again the importance of the correlation of sanatorium with surgical treatment. In the initial stages of pneumothorax rest in bed is essential. Until the temperature has settled down, until the pulse-rate has steadied and the patient's general condition has improved, exercise is strongly contra-indicated. Further, constant X ray control is essential. There is the danger of excessive mediastinal displacement and of hernia of the pleura; there is the still greater danger of tearing open thin-walled cavities when partially held out by adhesions; there is the frequent complication of pleural effusions which necessitate alterations in the routine of the refills of gas; there are the difficulties associated with the lung that refuses to stay collapsed, and creeping out despite refills, becomes progressively adherent.

ADHESIONS.

The serious import of adhesions is clearly shown by the results. With a complete pneumothorax 48·5 per cent. of the patients heal and can return to and carry on with their work; but with a pneumothorax in which the collapse is interfered with in whole or in part by adhesions, only 9·3 per cent. are so restored to health. The finest adhesions will often rupture, especially during a fit of coughing when the intrapleural pressure is considerably raised. Moderately fine adhesions will stretch, and may, in time yield sufficiently to allow efficient collapse of the lung. It is the broader string-bands and the veils which are the trouble. Some of these contain vessels of considerable relative size; others are fibrous in their peripheral part only, whilst the central part consist of a cone-shaped, drawn out part of the lung. It is obvious, therefore, that the division of these, unless special precautions are taken, is accompanied by the risk of hæmorrhage from the vessels or of the escape of blood and air from the divided part of the lung, and later of infection also.

The invention of the thoracoscope which enables one to see in the pleural cavity led naturally to the thermocautery for the division of these bands. The latest advance has been the use of diathermy, which coagulates the adhesion and diminishes still further the risk of hæmorrhage from the vessels when dividing the adhesion. Hitherto the thoracoscope has been introduced through one cannula and the cautery through another. Quite recently F. G. Chandler has brought out a thoracoscope of small calibre which combines the means for applying a diathermy current and of cauterising the adhesion. It is a most ingenious and practical instrument, and enables one to tackle with confidence quite large adhesions and broad bands.

COMPLICATIONS.

The commonest of all the complications of artificial pneumothorax is pleural effusion. It is said to occur sooner or later in from 30 to 50 per cent. of all cases. It may be transient, being rapidly absorbed, and in such cases it is usually beneficial, as it may lead to a less rapid absorption of the gas. More often an effusion, once it has started, tends to become chronic. The effusion may be sterile or loaded with tubercle bacilli. At first the effusion is clear, with a small cellular content; after repeated aspiration it becomes richer in cells and fibrin, to such a degree at times that it is very difficult to aspirate. The onset of an effusion is generally associated with increase of pyrexia, and sometimes interference with the fluid leads to greater rises of temperature. An effusion may on the one hand cause increase of intrapleural pressure which is deleterious; on the other hand, it may cause the lung to become adherent and to re-expand. In long-standing cases there is always the danger of secondary infection. An effusion causing symptoms of distress from too high a positive pressure must be aspirated and replaced with air; it is unwise, however, to remove the whole of the liquid. If the liquid contains tubercle bacilli, it may be possible in the earlier, more acute stages to sterilise it by injecting methylene-blue in absolute alcohol. Later the effusion should be replaced with olive oil and gomenol. If the effusion is persistent despite these methods of treatment thoracoplasty may be indicated.

Oleothorax.

The use of oil in the pleural cavity has been practised now sufficiently long to permit of a certain amount of dogmatism as to its indications and its value. The oil used is either olive oil or paraffin, to which has been added 0·5 to 5 per cent. of oil of gomenol. Oleothorax is not an alternative to pneumothorax, though on occasion it may be used as a substitute. An oleothorax must never be attempted in a virgin pleural cavity on account of the reaction likely to be produced. The value of gomenol oil is due to its disinfectant action, to the changes it produces in the pleural membranes, making them more rigid and impermeable, and, on occasion, to its compressing action on the lung. One of the most important indications of gomenol oil is in the treatment of pyo- or pyo-pneumothorax, whether occurring as a complication of artificial pneumothorax or from other causes, when either the pleura is infected with tubercle bacilli alone, or in the treatment of a mixed infection. In these cases also the oil must not be used until the acute stage of the lesion has subsided. In cases of pyopneumothorax complicated by bronchial fistula oleothorax may be successful in obliterating the fistula and clearing up the infection in the cavity. In cases of pneumothorax with hernia of the pleura or with a mobile mediastinum, gomenol oil will prevent the recurrence of the former by causing thickening of the pleural membranes; for the same reason it will cause fixation of the mediastinum. An oleothorax may lead to greater compression of the lung than can be obtained by a pneumothorax; it may also retard the obliteration of a pneumothorax when the lung is becoming progressively adherent. Lastly, in certain cases of artificial pneumothorax, for which the frequent refills of air are difficult to arrange, gomenol oil may be substituted for the air. The thickening of the pleura and the slow rate of absorption enable the intervals between the refills to be prolonged from every two weeks or so to about two months. Olive oil is absorbed more rapidly than paraffin, and is, for this reason, more generally used in the treatment of effusions. When an oleothorax is done to replace a pneumothorax so as to

extend the interval between the refills paraffin gives the better results. The great precaution necessary with either olive oil or paraffin-gomenol is to test the reaction of the pleural membranes to it. A big initial dose may produce an alarming reaction. For this reason 5 or 10 c.cm. should be the maximum amount injected at the start. This can be increased to 30 or 50 c.cm. at the next injection, while subsequent doses can be doubled or trebled according to the absence of pyrexial response.

The simplest method of injecting gomenol oil is by means of a Jubet blood transfusion syringe or with a 30 c.cm. syringe. A short needle should be used with a bore of 1 mm. The oil must be warm. When treating an effusion this must be aspirated before the oil is run in.

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SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN LONDON.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

THE annual Representative Meeting of the British Medical Association opened at Tavistock-square on July 18th, with Dr. C. O. HAWTHORNE in the chair. Dr. W. G. WILLOUGHBY, medical officer of health for Eastbourne, was elected President of the Association for 1931–32.

Expansion of National Health Insurance.

On behalf of the Council, Dr. H. G. DAIN moved a resolution stating that the time is now ripe for the medical profession to ask that the dependents of insured persons should be included under the national health insurance scheme. The attitude of the public towards their medical service was, he said, steadily changing; there was an increasing tendency to consider that medical attention was necessary for minor ailments. While it was desirable that an efficient medical service should be available for everyone, its maintenance must become increasingly costly; the general practitioner stood between the devil of encroachments by the public health centres and clinics, and the deep sea of a whole-time medical service which might suddenly engulf him. It was futile to try to forbid development along one or other of these lines. Under the new Local Government Act local authorities had acquired a wide control of hospitals and certain domiciliary services. Extension of the present service of clinics and welfare centres of various kinds could be made gradually without any sudden outlay, but the inclusion of dependents in the national health insurance scheme would mean the immediate provision of a large sum of money. Left in the hands of the local authorities the clinics would gradually gather in this class of patient completely, leaving the medical profession no say in the matter. In some parts of London a well-patronised public medical service run on a contributory basis afforded an objection to a compulsory insurance scheme, but this appealed only to the thrifty type of patient and was not accepted generally. The time had come for practitioners to choose between an insurance system with a free choice of methods, and a whole time medical service with control by the local authorities.

An amendment to this motion, introduced by Dr. E. WARD (Torquay), to provide that the capitation rate for such dependents should be not less than that paid at present for insured persons was lost, on the ground that it limited any demands for remuneration to that sum. But an interpolated plea from Dr. DAIN that policy should not be mixed with business, and that the financial question should be postponed until later, provoked a robust protest from Mr. E. B. TURNER (Kensington). It had been his happy lot, he said, to avoid panel practice, but observation had led him to the conclusion that it was ludicrously underpaid. This was the fault of the medical profession for accepting the system without first demanding a sound financial basis, and unless remuneration were discussed before Dr. Dain's motion was carried, the same result would occur in this case. Any scheme involving the care of women and children would entail an enormous increase of domiciliary work, and if the service were not to be disgruntled adequate payment was an essential. Mr. Turner threw in a frank reflection on the origin of the fees: obviously they could not come from the employer, or the man of many children would be permanently out of work; the insured person himself was unlikely to be in a position to pay; in fact the scheme meant another sixpence on the income tax, so there was every reason why the capitation rate should be adequate.

Dr. J. S. MANSON (Warrington) proposed an amendment, which was carried, to the effect that the extended service should include adequate safeguards respecting remuneration and terms of service. Dr. DAIN then put the motion in the amended form; it was, however, opposed by Dr. PETER MACDONALD (York), who said that his constituents considered that in their district the community was already fairly well served, that in the event of inclusion of dependents in the scheme the economic condition of the doctor would be worse and the work increased to breaking strain, and that they deprecated any step that would reduce private practice. Dr. H. M. STRATFORD (North Kensington) spoke of the London Public Medical Service, now in action at Paddington and North Kensington, which, he said, was successful enough to make any additional scheme appear unnecessary to practitioners who belonged to it. Dr. H. B. BRACKENBURY recalled to the meeting the major premiss of Dr. Dain's argument. It was not possible to ensure that the present state of affairs would continue. To pass the motion was the only way to avoid the danger of a whole-time medical service, which would undoubtedly be adopted in the course of the next few years unless some alternative plan were offered.

Dr. DAIN, in summing up, said that in many industrial areas there was no private practice among dependents of insured persons; this large body of patients attended clinics and hospitals. Only by their proposed inclusion in the national health insurance scheme could they be brought under the care of the general practitioner. The amended motion was then carried.

Hospitals and Private Practice.

The Council has this year provided a revised hospital policy based on a reconsideration of the entire scheme. The classification of patients has now been made under three headings, free, contributing, and private, thus avoiding the term "tariff patient," which never received unqualified approval. Sir RICHARD LUCE, who introduced the new policy to the meeting, ran over the changes involved in it. Among the special services there had been no alteration beyond the addition of an appendix on the provision of pathological services. The future relations of the voluntary hospitals and the new council hospitals under the control of the local authorities must be considered closely. The profession could not stand aside from council hospitals, but the terms on which the work should be undertaken were still to be decided. In the past the profession had always expressed a preference for the voluntary system, but there appeared to be some weakening from this view; some doctors held that the time for the voluntary hospitals was past and that their efficiency was declining, but there could be no doubt that a large number were still in favour of the system and held to it as an article of faith.

The provision of hospital beds where general practitioners could treat their own patients had been the subject of a resolution by the Panel Conference in 1928. To ascertain the practicability of such a scheme a questionaire had been sent out to 830 hospitals, of which 648 had replied. An analysis of the answers showed that none of the London or provincial general teaching hospitals had a local medical staff; that only two out of 109 of the larger general non-teaching hospitals had such a staff, and less than half of the general hospitals with under 100 beds. Opportunities for treatment of private patients in special wards were almost entirely confined to hospitals with less than 100 beds, so that there was little scope for the admission of general practitioners at present. There was no reason why they should not be given more opportunities in those hospitals which provided special wards and annexes, and it was believed that still more scope could be offered in the smaller hospitals—those with less than 100 beds. The new council hospitals would provide a fresh opening; it might be possible to obtain special accommodation for private patients and to treat others in the wards. If this were to be done the principle must be formulated now and admitted by the local authorities, or the opportunity would be passed over without forming any basis for future action.

Remuneration for members of the profession on hospital staffs was still in abeyance. Medical men were diffident about demanding payment where a hospital was in financial difficulties. Obviously, it would be much more satisfactory if the pressure came from some external body; the establishment of a precedent was the first step, and in two centres in the north this had been recognised. Speaking of the new policy as a whole, Sir RICHARD said it was simple, and lent itself to adaptation. It contained, he believed, no change of principle which would be unpleasing to the profession.

THE "COUNCIL" STIGMA.

A lively debate was introduced by Dr. M. W. RENTON (Dartford) over the hypothetical effect on the lay public of the term "council" as applied to hospitals. The ghost of Mother Poor-law, it seemed, had still power to cast her shadow over the future, and minds made sensitive by life in council houses and education at council schools might rebel against the ægis of the council in sickness at least, if not in health. But hardier opinions prevailed, and it was felt that the Briton would not be deterred by a mere generic term from attending a hospital which would doubtless boast a local name as well.

PLACE OF PRACTITIONER IN COUNCIL.

Dr. E. R. FOTHERGILL (Brighton) introduced an amendment suggesting an alternative scheme to be added to that proposed in the policy for the staffing of council hospitals. The policy provided for a full-time medical superintendent, a senior resident staff, a junior resident staff, a consultant visiting staff, and clinical assistants appointed from amongst practitioners of the area. Dr. Fothergill's alternative scheme differed from this only by proposing a whole or part-time medical superintendent, the omission of the senior resident staff, and the addition of a part-time general practitioner visiting staff to have responsible charge of beds and clinics. In small hospitals, Dr. Fothergill pointed out, a full-time medical superintendent might have so little work to do that he would be wasting a large part of his time, and a senior staff of men with the M.D. and M.S. degrees would develop a limited outlook if appointed permanently. A visiting staff of general practitioners would mean the admission of the family doctor to the hospital scheme, from which he had been excluded far too long.

In the discussion which followed the desirability for a senior resident staff, especially in areas where the accident incidence was high, was emphasised by Dr. J. T. D'EWART, and supported by Mr. N. BISHOP HARMAN. The view that the practitioner should be in a position to attend his patient in hospital met with considerable support from Dr. C. E. S. FLEMMING, who spoke of the disheartening and demoralising effects of losing touch with a patient at the most interesting stage of his illness. In many cases the practitioner was perfectly qualified to carry on the treatment if he had facilities at his disposal. By undertaking the post of clinical assistant a practitioner who wished to specialise would have opportunities to follow up the type of case in which he was interested. Mr. E. W. G. MASTERMAN saw an objection, however, to Dr. Fothergill's scheme in that it failed to state who was ultimately responsible for the patient: was it the general practitioner, the medical superintendent, or the consultant? The possibility that the practitioner might be engorging more than he could conveniently swallow was suggested by Mr. H. M. STRATFORD (Kensington). He pointed out that at a previous session the representatives had cheerfully accepted the dependents of the national insurance patients as their inevitable responsibility, and now they were clamouring for the onus of consultant's work at hospitals as well. He thought that Dr. Fothergill's amendment really embraced too much. Sir RICHARD LUCE said that he was quite prepared to accept Dr. Fothergill's amendment. The scheme of staffing proposed by the hospitals' committee would apply to the large municipal hospitals; that suggested by Dr. Fothergill was perfectly applicable to smaller hospitals. But he thought the "medical superintendent" should not be described as "whole or part-time," and that these words should be deleted. Dr. FOTHERGILL accepted this alteration, and his amendment was carried as an alternative scheme to that of the Council.

THE INCOME LIMIT.

Incorporated in a footnote of the hospital policy were the suggestions of the committee for an increase in the income limit in contributory schemes, the highest income not to exceed £350 or £7 a week. Dr. F. H. BODMAN (Bristol) proposed adherence to the old scale with £300 as the highest limit; an increase would result in loss of private practice to many practitioners. Other speakers considered that it would mean an encroachment on the junior consultant's fees as well. Sir ROBERT BOLAM explained that the raised limit was designed to include those foremen and higher workers in industrial areas who would really form the backbone of the scheme. A small difference in wages might be sufficient to put these workers outside the scheme and as they were few in number their inclusion would be no great loss. Mr. W. MCADAM ECCLES held that the effects of trade depression should be considered, those who were making a stout struggle against it should be encouraged by the opportunity to join such a scheme. Trade depression, however, falls alike on the unjust and the just, and Dr. R. M. MANWARING-WHITE was inclined to see its saddest effects on the junior consultant. Dr. N. E. WATERFIELD pointed out that to add to the numbers supporting contributory schemes would be to lessen the contributions to hospitals, since persons belonging to these schemes received special concessions in hospital.

The feeling of the meeting was opposed to an increase in the income limit. Dr. Bodman's views were endorsed by the meeting.

FREE CHOICE OF PRACTITIONER.

Dr. D. F. TODD proposed an amendment from Sunderland, suggesting that:

> "Whether in the private rooms or wards of hospitals which have both public and private wards in the same building or in the special accommodation for private patients of a separate home or hospital provided exclusively for such patients, such home or hospital being an annexe of, or associated with a voluntary hospital having public wards, every private paying patient shall have 'free choice' of practitioner as his attendant, and of consultant and or specialist, and that anything to the contrary in the proposed revised hospital policy shall be deleted."

Sir RICHARD LUCE said this amendment involved an alteration of the old hospital policy rather than the new. The feeling in most hospitals was against letting general practitioners into the general wards, and it had seemed advisable to limit their opportunities to patients treated in a separate annexe. Dr. H. B. BRACKENBURY opposed the motion on the ground of injustice to the consultant. The private wards contained the paying, and the general wards the non-paying patients; it was unfair that the general practitioner should retain control of all those that paid and hand over all those who must be treated for nothing. There was no reason why any hospital which desired to make the change suggested by Sunderland should not do so, and nothing to prevent the general practitioner from having such control of treatment as he and the consultant agreed between them. This part of the scheme, it should be remembered, applied only to those hospitals where private rooms or wards were found in the same building as public wards.

Dr. PETER MACDONALD supported the amendment; in the future it was hoped that members of hospital staffs would receive payment, so that the consultant would no longer be treating patients in the general wards for nothing. His view was shared by Dr. A. B. MURRAY, who felt any other attitude to be contrary to the policy of the Association. Opposition to the amendment was offered by Sir ROBERT BOLAM and Mr. BISHOP HARMAN, both of whom felt there was every necessary safeguard to the general practitioner in the policy as laid down. The paragraph in the policy which provoked discussion ran as follows:—

> "When special accommodation for private patients takes the form of private rooms or wards in a hospital which has both public and private wards in the same building then: (*a*) if the hospital has a resident medical officer or officers and also a visiting staff which is ordinarily responsible for the care of all patients in the public wards—the patient should be under the responsible care of a member of the visiting staff, in association with the private practitioner of the patient who should have free access to the patient and should have such share of the responsibility and treatment of the patient as may be agreed upon between the member of the visiting staff and the private practitioner. . . ."

Dr. E. R. FOTHERGILL said that all the arguments used embodied two extremes. In a hospital with a visiting staff it was supposed that the staff assumed the view that all private wards were theirs and the general practitioner should not come into them, while the general practitioner was said to regard the private wards as his, and to demand the choice of consultant. The compromise was for the practitioner to go into the wards, and for the consultant to decide with him the responsibility that each should have in the case.

In replying to objections to the amendment Dr. TODD said that he was thinking chiefly of provincial hospitals where the staffs were often composed of general practitioners, who might even be in panel practice. It was most undesirable that a doctor should have to hand over his patient in hospital to a rival practitioner. Dr. BRACKENBURY asked whether Dr. Todd would be willing for his amendment to apply only to those hospitals where the staffs were composed of general practitioners. Dr. TODD agreed to the suggestion, but Dr. HAWTHORNE from the chair pointed out the pitfalls which awaited those who would draw a dividing line between general practitioner and consultant; on his proposal the amendment and the debated paragraph of the policy were referred back to the Council for further deliberation.

HOSPITAL RECORDS.

Another amendment moved by Dr. TODD, for Sunderland, referred to a short paragraph on the confidential nature of hospital records, and demanded the deletion of a phrase at the end reading "and access to them allowed solely to members of the visiting staff of the hospital." It was clear from the outset that what Dr. Todd, and indeed the meeting as a whole, wished to establish was that the general practitioner should also have free access to the records, while unauthorised persons should not. An interlude followed in which the meeting struggled for words to express this simple thought. After a complicated and painful labour the amendment was reborn and accepted in the following form: "These are confidential documents and access to them should only be allowed by the medical practitioner or practitioners responsible for the care of the patient."

OTHER AMENDMENTS.

Dr. F. RADCLIFFE, for Oldham, objected to certain paragraphs in the policy which estimated the number of panel patients treated at hospitals at 80–85 per cent., of indigent poor at 15 per cent., and of private patients or persons above the income limit at 5 per cent. He moved the deletion of these figures as being inaccurate in parts of the country other than that for which they were calculated. He deprecated

the inclusion in the scheme of figures which could be challenged and overset. Sir ROBERT BOLAM explained that the figures were carefully qualified by the context and were designed to give persons outside the profession some idea of the magnitude of the question. For the country as a whole the figures were not inaccurate, though they doubtless failed to cover the facts in certain industrial areas. The meeting decided that the paragraphs should be retained unaltered.

Dr. H. MACWILLIAM introduced an amendment not on the agenda referring to a paragraph in the Council's policy for hospitals with 100 or more beds. This read: "The visiting staff should be of a recognised competency, and should be proportionate to the number of beds in the hospital; a suitable ratio is about 1 to every 25 beds, or where out-patient departments exist the ratio of the staff should be greater." Dr. MACWILLIAM said that in a hospital of 1500 beds such a small number as 25 would be unreasonable, while if there were many chronic cases the consultant would have very little work. Dr. R. K. FORD (Preston) pointed out that the whole of this section, dealing with the standards for hospitals with 100 or more beds, was not applicable to the Council hospitals as drafted. The meeting therefore referred back this part of the policy to the Council for reconsideration.

Two amendments to postpone any decision on the policy until next year were defeated, and the hospital policy as amended was put to the meeting for approval and was accepted.

A General Medical Service.

Dr. J. W. BONE, who introduced this subject, was careful to point out that no scheme had as yet been formulated for a general medical service. All the Council wished to submit was a series of proposals which might form the basis of such a scheme. There had been a constant demand from the country of late years for health services supplied by the State and each of the political parties had had plans for adding to these services. It was necessary for the Association to be ready with proposals which voiced the opinion of the medical profession if coöperation became desirable. The proposals had their origin in a request from the Representative Body two years' previously that the Council should inquire into the increasing encroachments of one sort or another on medical practice. After hearing the report the Representative Body advised the Council to produce constructive proposals, and these were now set forth. The Ministry of Health had had no hand in their production, which was the work of seven consultants, five medical officers of health, and twelve general practitioners.

The persons included in such a scheme must be all the members of the community for certain services not obtainable otherwise, but a proportion of them would, of course, pay for such services. A second group, comprising the dependents of insured persons, would cover their service, either domiciliary or institutional, on some insurance plan. Finally, there were the indigent for whom the cost must be borne by the community. Both the family doctor and the consultant services would be provided on a contributory basis; institutional treatment would at present depend on the voluntary and council hospitals—the old poor-law institutions—since no other services were available. The financial aspect of the scheme had not yet been considered, because if the proposals were accepted that would require the attention of a different body. These proposals were merely a contribution to any national discussion on the subject in the future, and it was for the meeting to decide on the cardinal principles and help to set them out.

Dr. J. W. E. CORY (West Suffolk) suggested that the scheme would never have been formulated except under the threat of a whole-time medical service by the State, and that therefore the assertion in the Council's proposals "that it is in accordance with the beliefs and traditions of the medical profession" should be replaced by a declaration that the scheme was advanced only as a preferable alternative to a State medical service.

This frank proposal provoked much opposition; Dr. H. M. STRATFORD pointed out that the idea of a State medical service was at present only a bogy, and Dr. BRACKENBURY reminded the meeting that this was not the submission of a scheme requiring acceptance but an opportunity for discussion of principles which might ultimately have administrative effects. It was unwise to adopt an unconciliatory attitude at the outset. Dr. H. W. POOLER hoped that no statement would be allowed to go forward which implied that the medical profession was afraid of anything; least of all of a State medical service. In face of this opposition Dr. CORY's amendment perished.

Dr. A. B. MURRAY (Banff, Moray, and Nairn) proposed the alteration of the principle given in the proposals: "That the interposition of any third party between the doctor and the patient, so far as actual medical attendance is concerned, shall be as limited as possible," to: "That there shall be no interposition of any third party between the doctor and the patient so far as actual medical attendance is concerned." Dr. BONE spoke of several uncomfortable situations in which such interference was inevitable—for example, excessive prescribing or in malpraxis. The meeting rejected the amendment, and was addressed again by Dr. MURRAY on a different plea. He proposed that in any arrangements made for a communal or subsidised or insurance medical service the medical profession should be represented on the bodies responsible for the administrative and financial control of that service. The Council's proposals had required only free consultation with the medical profession by these bodies, but Dr. MURRAY suggested that this was inadequate. Dr. BRACKENBURY remarked that the two bodies in question appeared to be the Treasury and the Ministry of Health, on neither of which the profession could claim representation. The county councils or county borough councils were scarcely bodies on which a medical representative need sit. This amendment was also lost.

CARE OF THE INDIGENT.

An ingenious plan for the inclusion of indigent persons in the scheme had been provided by Dr. Brackenbury in the proposals, and was as follows:—

> "The cost of the domiciliary medical attendance of what has been known as the pauper class is known, or could easily be ascertained in every area, for, say, the last five years. This divided by the number of persons attended would give an average cost per person for domiciliary attendance. This amount per head could be paid by the Public Assistance Committee into the local national health insurance pool for each person referred by that committee for domiciliary attendance."

Dr. H. C. JONAS (Barnstaple) moved the deletion of this method from the proposals on the grounds that it had been decided not to consider financial questions as yet. The records kept by poor-law officers were not such as to make the method

practicable in any case, and at this stage it was impossible to arrive at any accurate figure.

Dr. BRACKENBURY said that it was difficult to find a method whereby these persons could be included in any scheme, and this had been formulated in reply to the question put by the Royal Commission: "Can you give us an illustration?" At the time no illustration had been forthcoming, but he believed this suggestion to be practicable. The pool, of course, would belong equally to paupers and non-paupers, and capitation fees would be redistributed from it irrespective of the class from which the patient came. Dr. JONAS said in reply that he was entirely in favour of the inclusion of the pauper class, but it was a difficult problem and should not be touched on in a document of this sort. It was decided to delete the passage.

A PROPHECY.

Among the proposals the following statement finds a place: "When all the work done in hospital is paid for, the scale of fees for outside work (which may be expected to diminish under this scheme) will naturally tend to adjust itself to the new circumstances." Dr. L. A. PARRY objected to this as misleading; if the hospital service were extended he said, outside work would be less than ever, and it would be impossible to charge lower fees. Dr. BONE replied that it was the only example of prophecy among the proposals. It was a case of the law of supply and demand; if members of the profession were properly paid for the work they did in hospital they would be in a position to charge less outside. This was one of the paragraphs in the proposals which would appeal to the general public, especially the middle classes. The statement was allowed to stand.

ADMINISTRATIVE DIFFICULTIES AND FINANCE.

Dr. E. R. FOTHERGILL, for Brighton, objected to the proposal that access to the local authorities should be through the medical officer of health, who, he thought, was not necessarily in sympathy with the practitioners of his area. The point introduced an interesting discussion on the relations usually existing between these parties, but the feeling of the meeting was that the local practitioners should have direct access to the county council or other administrative body when they so desired.

Dr. MILBANK-SMITH supported Dr. FOTHERGILL. The Insurance Act, he said, could never have been administered without statutory local medical committees; the scheme under discussion would be even more universal in its action. Under the proposals as they stood the medical officer of health would have to accept great responsibility. The county council would probably meet about four times in the year, and in the intervals he would often have to make decisions without consultation with that body. There should be a statutory medical committee with which he could confer on these points. Such a plan would be much simpler than one by which all small differences of opinion between the medical officer of health and the local practitioners were referred to the Council of the Association.

Dr. MIDDLETON MARTIN agreed that there was much to be said for the point of view adopted by Brighton, but he, as a medical officer of health, had discussed this question with his colleagues and they foresaw many difficulties in administration should Dr. Fothergill's amendment be carried. He thought that too many cooks might spoil the broth if the medical officers of health were forced to refer to a medical committee. The interests of the profession were the concern of the M.O.H., and he looked forward to the amicable coöperation of general practitioners with this officer. A division of opinions placed before the local authorities would complicate administration.

That the proposals of Brighton did not go far enough was the plaint of Dr. D. O. TWINING. Medical officers of health varied in their behaviour to other members of the profession in their area; some were Mussolinis and some were mice. Either variety was capable of reversing his opinions in a disconcerting manner, and one had been known to expect a revised decision to act in retrospect. If administration depended on one man in an area, efficiency depended solely on the character of that man; responsibility of such a kind was too great—it should depend on a local committee.

Dr. CHRISTINE MURRELL epitomised the arguments used in favour of the amendment when she said that though such direct access would probably be seldom needed, it was a useful power. The paragraph in the proposals was altered as suggested.

An estimate of the cost of the scheme had been introduced into a separate section of the proposals, calculated on a basis of figures obtained from the report of the Royal Commission on National Health Insurance in 1926. These figures, which had been included only for the sake of completeness, and to convey some idea of the financial aspect to the general public, were challenged by Dr. J. W. E. CORY on the grounds that they were not only out of date, but sketchy and misleading. A subsequent suggestion that the section might be left in if all the figures were deleted, though it gained the support of Dr. BRACKENBURY, was earnestly opposed by Mr. H. S. SOUTTAR, who protested against the emasculation of the scheme by the removal of a relevant part. The first question of any reasonable man, he said, when faced with these proposals would be: "How much will it cost?" and to put forward the scheme without giving some idea of its expense would be ridiculous. Dr. BONE agreed with him; no one would be satisfied by the mere statement that estimates had been made; he would want to know what they were. The section under discussion was retained unaltered.

Dr. A. S. WILSON proposed for Holland, Lincs., that the head of the local medical arrangements under these proposals should be a practitioner who had had a considerable number of years' experience of private medical practice. His argument was based on the ignorance, in some cases, of general practice by the medical officer of health, who might otherwise become the head of these local arrangements. The meeting, however, was not prepared to proceed to these lengths, and the amendment was lost.

Dr. BONE introduced an amendment to add to one of the principles laid down in the proposals—namely, "that medical benefits of the present National Health Insurance Acts should be extended so as to include the dependents of all persons insured thereunder." He suggested the insertion of the words "entitled to medical benefit" after "persons," since it was not intended to include "voluntary" subscribers who were not entitled to medical benefit. This alteration was approved.

An amendment to delay acceptance of the amended proposals, introduced by Dr. G. B. HILLMAN, was discussed very fully. It was stated that attendance at divisional meetings of the Association is often so poor that it is impossible to be sure that the

proposals have received the consideration of more than a fraction of the profession. For this, however, practitioners had no one but themselves to blame in the opinion of the meeting, since the proposals had been before them since April. The need for an early acceptance was urged by Dr. PETER MACDONALD, who said that the scheme should be available as propaganda as soon as possible, and by Dr. BONE, who thought that medical practitioners would not realise that the scheme had come into practical politics until these proposals were passed. The proposals, as amended, were eventually carried, whereupon Dr. BRACKENBURY introduced a statement to explain the absence of reference to insurance committees in the proposals, the motion being that the Council should be authorised to use the statement in any way which seemed likely to be useful.

The statement was as follows :—

Insurance committees, under that title or in their present form, are not mentioned in these proposals. The reason is that the ultimate aim of the Association is the unification—not merely the coördination—of the administration of all health services, nationally and locally. This, it seems, can only be accomplished by the establishment of a statutory committee (called in the present proposals the "Hospitals and Medical Services Committee") as an essential and integral part of the organisation of the work of county councils and county borough councils which in this way would exercise a general supervision, under regulations made by the Minister of Health, over the insurance medical services, and bring them into intimate relationship with hospital and institutional services provided or supported by the local authority. There is no reason, however, why the personnel of the new statutory committee should not, if after discussion this seems desirable, approximate still further to that of the existing insurance committees by including also appropriate representation of insured persons through approved societies. Meanwhile, in the not improbable event of some such proposals as those now put forward being adopted, not as a whole but piecemeal, it would be appropriate that extensions of the insurance service to the dependants of insured persons or the provision for such persons of a consultant and specialist service should, as an interim measure, be administered by insurance committees as now constituted. In that event the question of the relationship of the new provision for medical advice and treatment with other services provided by the local authority with a view to the promotion of economy and the prevention of reduplication would require careful consideration, and arrangements for the appointment of a chief medical officer in administrative charge of all the health services would be very desirable.

Dr. BRACKENBURY pointed out that this statement changed nothing in the scheme, and was merely designed to reply to the inquiries of insurance committees on their exclusion from the proposals. The committee suggested it would resemble an insurance committee, but the representation on it would be in other proportions.

Dr. H. C. BRISTOWE suggested that all of the statement following "institutional services provided by the local authority" should be deleted as irrelevant. Dr. H. G. DAIN and Dr. MACDONALD opposed this suggestion, and were able to put the advantages of the insurance committees before the meeting, as bodies usually powerfully influenced by the weight of medical opinion. Dr. BRISTOWE was induced to withdraw his amendment, and the original statement was referred back to the Council for consideration.

(To be concluded.)

ROYAL FREE HOSPITAL.—During the past year the total expenditure was £80,545, and the income £73,006; patients and their societies paid £19,346. The bank overdraft exceeded £30,000. Charges in the out-patients' department have been increased (average per attendance, 1*s.* 11½*d.*); in-patients (average daily number, 233) cost £4 8*s.* per week. It was expected that this year bank interest would approximate to £2000. X ray films are now being stored for safety's sake in an external building.

MEDICINE AND THE LAW.

The Coroners Amendment Act: an Interesting Point.

His Honour Judge Hill-Kelly, sitting at Redhill County Court on July 16th, gave judgment in the case (heard last month) in which Dr. David Low Greig, of Caterham, claimed £22 1*s.* for attending a post-mortem examination and giving evidence at an inquest in respect of the deaths of seven persons at Caterham, on Nov. 8th last, from Mr. F. J. Nightingale, of Reigate, the Coroner for East Surrey. When the action was heard, Mr. H. C. Dickens (for Dr. Greig and the Medical Defence Union) explained that the dispute was a friendly one, as a result of which it was hoped to get His Honour's interpretation of Section 23 of the Coroners Amendment Act, 1926. Mr. Milner Holland appeared for Mr. Nightingale and the Surrey County Council.

His Honour recalled that last November a number of persons were killed at Caterham as the result of an accident to an aeroplane. One of those persons was taken to the house of the plaintiff, there dying the same day. Later, defendant sent an officer to the plaintiff requesting him to go to a mortuary and view the bodies of the other six persons involved in the accident, to determine the cause of death in each case, and also to obtain details for purposes of identification. On Nov. 7th plaintiff attended the mortuary and examined the bodies. Defendant then instructed plaintiff to attend the inquest to be held by him on Nov. 8th. Plaintiff attended as instructed, and gave evidence as to the cause of death of each of the six persons whose bodies he had examined at the mortuary, and also as to the cause of death of the person who died at his house. Having done so, plaintiff was bound over to attend at an adjournment of the inquiry. He attended on that day. The inquiry was held by the defendant sitting as coroner, together with a jury. The course which was taken appeared to have been sanctioned by authority—namely, that where more than one person was killed at the same time, and apparently from the same cause, only one jury was sworn, and the inquiry into all the deaths was taken at one and the same time. Evidence had been given to the effect that the inquiry touching the deaths of the seven persons referred to was made at one and the same time. In those circumstances plaintiff claimed the sum of £22 1*s.*, contending that he was entitled to one and a half guineas in respect of each of the dead persons. Defendant contended that plaintiff attended to give evidence at only one inquest and was entitled to only one sum of one and a half guineas—that was to say, three guineas in all (in respect of the post-mortem and the inquest). The question thus raised depended on the proper construction of Section 23 of the Coroners Amendment Act of 1926, dealing with fees payable to a qualified medical practitioner. The section provided that a doctor should be remunerated in three different sets of circumstances—first, for his attendance at an inquiry without a post-mortem examination; secondly, for a post-mortem examination without afterwards attending an inquest; and thirdly, for making a post-mortem and giving evidence. In order to consider the section it was proper to have regard to the whole of it. It provided that a medical practitioner should be entitled to three guineas for making a post-mortem and attending the inquest to give evidence. Remarking that much depended on the reading of the Act on the interpretation of the word "inquest," His Honour

said it was a common practice for coroners to hold inquiries into the deaths of two or more persons at one and the same time, but in his interpretation of the law he thought there were as many inquests as there were dead bodies. The language of the Coroners Act of 1887 and the Amendment Act of 1926 seemed throughout, with one exception, to contemplate in the use of the word "inquest," one inquiry touching the death of one single person. The exception was in respect of two or more persons who die from the same accident and lay in different parishes or areas under different jurisdictions. In that case the Secretary of State might give an order for the removal of one of the bodies from one area to the other for the inquest. What was significant in that section was that the word used was "inquests"—in the plural. Having quoted a case in the King's Bench having a bearing on this interpretation, His Honour said that the result of that interpretation was that plaintiff was entitled to recover from the defendant the amount claimed—£22 1*s*. and he gave judgment for the plaintiff for that amount. It might appear a strange result of the case that a medical practitioner was entitled to so large a sum in respect of one inquiry, but the fact that the circumstances were unusual ought not to affect the interpretation of the Act of Parliament: no question could arise as to its reasonableness.

His Honour, in giving judgment, awarded costs on Scale C, and agreed to a stay of execution for 21 days, it having been intimated that the case may go to appeal.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

OVER 5000 delegates attended the annual meeting of the American Medical Association this year in Detroit. Of these nearly one-third came from the State of Michigan.

SOCIALISATION OF MEDICINE.

The retiring presidential address by Dr. M. L. Harris dealt with problems of medical economics. The organisation of the Public Medical Service Association in England was held up to delegates as a horrible example of "what may be expected to happen to the medical profession when it loses control of its own business." Similar interference is found in Belgium and in Prussia. "Medicine is being besieged on every hand by forces that are constantly growing stronger and stronger." As a remedy for this trend towards "socialisation," Dr. Harris proposes that county medical societies incorporate and organise for business purposes, and then establish medical centres owned, controlled, and managed by the profession, where all who cannot pay regular fees may receive adequate treatment at charges which are within their means.

The report of the secretary, Dr. Olin West, also called for aggressive organisation by professional groups, and urged the importance of these groups becoming leaders in the communities in matters of health, and in particular in popular health education. The central organisation in Chicago is already engaged through its Bureau of Health and Public Instruction in these activities. The work of this bureau was warmly approved.

ABUSE OF MEDICAL SERVICE TO HOSPITALS.

The new president of the association, Dr. William Gerry Morgan, dealt in his address with the history and evolution of charitable hospitals and dispensaries. He showed how in their origin they represented a coöperative enterprise, the charitable public providing the physical needs and the profession giving free of charge their professional skill. Now the simple asylum for the indigent sick has become in part the elaborate nursing hotel of the well-to-do, in part the costly laboratory of the surgeon, and in part a necessary instrument of medical education. The fact has been lost sight of that the physician's contribution is still the gift of his skill to the sick person, and that this contribution is not a part of hospital property to be donated or bartered according to the corporate judgment of its trustees. There are, of course, exceptions, such as private hospitals and hospitals constructed and operated entirely by public funds.

Dr. Morgan's conclusions, which are to be considered as a basis for a campaign of re-education of both the laity and the profession, include the following:—

(*a*) The physician is no more obligated to provide for the care of the indigent sick than his fellow citizen.

(*b*) In mutual charitable undertakings for the care of the sick, each citizen contributes what he has: the laymen, physical necessities: the physician, professional skill. But each has a right to protect himself from exploitation, and to judge of the merit of the recipients of his bounty.

(*c*) When a hospital offers its facilities to a mixed clientele, pay, part pay, and pauper, the distinction between the sources of those facilities should be clearly recognised. The physical equipment and service is of general public origin, and their uses may be sold or given away in the discretion of lay boards; but the professional facilities are, and always must be, the contribution of the medical staff as individuals and cannot become in any sense the property of the institution.

(*d*) When a hospital is owned and operated by government, and supported by taxation, to which the medical profession contributes its due proportion, medical attendance should be paid for by taxation, along with all the other facilities supplied by the institution.

(*e*) No hospital instituted and supported by public philanthropy or community coöperation of any kind should be premitted to increase its revenues, and so reduce its financial burden on the public, by any system of collecting fees for medical attendance, and thus engaging in the corporate practice of medicine.

TARIFFS AND MEDICAL APPLIANCES.

The Board of Trustees of the Association reported on the increased tariff which despite their efforts now falls upon a large number of articles "necessary for the diagnosis and treatment of disease." The duty on surgical instruments is increased from 45 per cent. to 55 per cent. (but not to 75 per cent. as urged by American manufacturers). The tariff on pharmaceutical or surgical instruments wholly or chiefly of glass is increased from 65 per cent. to 85 per cent., and so on. They add that it will be a matter of regret if the increased duty is made an excuse for excessive increases in retail prices.

MOTORING FATALITIES.

The House of Delegates took notice of the "steadily mounting death-rate from motor vehicle accidents, and of the fact that only ten States and the District of Columbia have mandatory examinations of drivers before granting licences. "They resolved that the association should use its influence to secure legislation in all States for physical examination, and that a committee study the subject further and formulate a model standard of physical fitness for drivers that can be recommended to State legislatures.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

IRISH MEDICAL COMMITTEES.

A MEETING of the Irish Medical Committee was held in Dublin on July 16th, Dr. J. M. Day presiding. It was reported that the National Health Insurance Commission had recently made certain deductions from the payments made to medical certifiers for furnishing certificates of medical incapacity. The rates of remuneration had originally been fixed by agreement between the National Health Insurance Commission and the Irish Medical Committee, and the Committee expressed the opinion that no change should have been made without consultation with it. A member reported that in his district a post of medical attendant to a station of the Civic Guard had recently been filled by inviting medical men in the neighbourhood to state the terms on which they would be prepared to give attendance, the post being given to the candidate who offered the lowest terms. The Committee strongly disapproved of such a method of appointment, as likely to lower the standard of medical attendance and as contrary to the principles of the profession. It directed a protest to be sent to the Minister for Justice.

A CONFERENCE ON PUBLIC HEALTH.

Mr. R. Mulcahy, Minister for Local Government and Public Health in the Irish Free State, recently summoned a conference to discuss questions concerning his department. The conference was held early this month in the Mansion House, Dublin, and was attended by representatives, including many medical officers of health, of all the local authorities dealing with health administration. The Minister delivered a stimulating opening address pointing out that the growth of public health work depended primarily on an educated public opinion on sanitary and health matters. Only public opinion could provide the driving force and clear the way for improvement. Dr. J. C. Saunders, medical officer of health for the City of Cork, read a paper on the methods by which health education could be promoted. Communal hygiene, he contended, should be national rather than local, and should be put into effect by a central organisation. The insanitary condition of the schools, especially in rural areas, was a great blot on the social system. The teaching of preventive medicine called for a more important place in the curriculum at medical schools. Dr. O'Higgins, county medical officer of health, Meath, and Dr. McDonnell, medical inspector, Local Government Department, spoke of the need of educating the public and the methods by which this could be done.

Dr. R. Conelly, medical officer of health for the county of Cork, opened a discussion on county health administration with particular reference to the functions of the county medical officer of health. He regarded the supervision of the production and handling of food, especially meat and milk, as of great importance. Where the circumstances of the area made it feasible, by-laws providing for a system of inspection and stamping of all meat before sale should be introduced. The annual report of the county medical officer of health should show the character and extent of the health work done over a given period.

Dr. Mary O'Leary, school medical officer for the county borough of Dublin, read a paper on the Health of the School Child. She urged the need of open-air schools and nursery schools, and in the meantime the establishment of summer convalescent homes or camps. The discussions aroused lively interest, both among the medical officers and the lay members of the local authorities, and the Minister has cause to congratulate himself on the success of the conference.

QUEEN'S UNIVERSITY OF BELFAST.

Presiding at the summer graduation ceremony of Queen's University on July 10th, the Chancellor, Lord Londonderry, said that this was a suitable occasion to "take stock," for the University came of age this year. Twenty-one years have elapsed since the Queen's College attained university rank, and the number of students has increased from 600 to almost 1400. The revenue of the University has not, however, grown at the same rate. The report of the University Grants Committee last year pointed out that Queen's was doing more work on less money than any university in Britain, and it also laid stress on the fact that Queen's was receiving less help from the Government, local authorities, and private benefactors. The six British universities with which it was compared received in gifts from private persons during the past five years sums varying from £479,000, the largest figure, to £66,000, the lowest. Queen's, during the same period, received in private gifts £2435. Lord Londonderry said that a student in any university only paid a third of what his education cost; he appealed to his hearers not to forget this when they left. He hoped that all would join the recently formed Queen's Association.

Before conferring the degrees the Chancellor referred with regret to the death of Dr. T. I. Candy, which had taken place between the reception and acceptance of his thesis for the M.D. degree of the University.

In addition to the names published in THE LANCET of June 28th Samuel Nevin received the degree of M.D., with gold medal. The Adami Medal in Pathology was awarded to William S. Campbell; the Symington Medal in anatomy to David C. Porter, and the Sinclair Medal in Surgery to Arthur G. Ross.

The headmasters of the secondary schools in Northern Ireland consider that the standard of Latin set in the Matriculation for the Faculty of Medicine and in the Senior Certificate examination of the Ministry of Education too difficult for the average schoolboy. The Medical Faculty, unwilling to admit students without some knowledge of Latin, have met the difficulty by new regulations, passed by the Senate, whereby after the session 1931–32 candidates are required to have studied Latin and to have obtained therein 40 per cent. at the Junior Certificate examination or at an equivalent examination. The Senate also adopted regulations for the recently instituted Diploma in Psychological Medicine.

The examinations for medical degrees will henceforth be held in June and December and not in March and June, and the session in the Medical Faculty will commence in the beginning of October and not in the middle of the month.

ROYAL SOUTHERN HOSPITAL, LIVERPOOL.—The number of out-patient attendances last year increased by nearly 10,000 notwithstanding efforts to use the department as a consultative centre for the treatment only of the more serious cases referred by doctors. The principal increases were in the electrotherapeutic and massage and actinotherapy departments. The surgical work is increasing so rapidly that plans have been prepared for the extension at a cost of £25,000 of the operating theatre and X ray unit. In the last five years the number of radiograms taken (13,246) has nearly doubled. There were close upon 17,000 attendances for massage.

THE BEIT MEMORIAL FELLOWSHIPS.

NEW ELECTIONS.

In 1909 Sir Otto Beit made a gift of £230,000 for the endowment, not of buildings, but of men and women who were equipped and anxious to devote a few years of their lives to research in medicine and the allied sciences, but lacked the means to do so. At first the values of the Fellowships were £350 per annum for three years for Junior Fellows; £400 for fourth year Fellows; and £500 for three years for Senior Fellows. These stipends were increased in 1927 respectively to £400, £500 and £700.

The trustees of the fund are assisted in the selection of candidates by a scientific advisory board, and in the annual report for 1929 this board expresses the opinion, in which all will concur, that the founder has every reason to be satisfied with the results obtained during the first 20 years of the life of the trust. The total number of Fellows elected up to and including 1930 is 138.

Ignoring the more recent appointments, the report analyses the subsequent career of the 101 Fellows appointed up to 1925. We made a similar analysis in THE LANCET (1926, ii., 1019) of the first 70 Fellows, and it is interesting to see that the more recently appointed Fellows follow much the same paths as their distinguished predecessors.

Of the 79 men elected to Fellowships up to 1925, seven died at a relatively early age. Four have received the F.R.S., and 16 have been appointed to University Professorships. Most of the remainder occupy whole-time posts for teaching, research, or scientific work. Of the total of 52 who held medical qualifications when appointed, 13 have passed into medical practice, consulting or otherwise, but the majority of these are continuing scientific work.

Of the 22 women elected during the same period, a few have married, but all continued for many years the work of research and many are still thus engaged. That they hold, or have held, such positions as members of the scientific staff of the Lister Institute; university lectureships in biochemistry; pathologist and bacteriologist to general hospitals and boards of health; head of a department in an institute for medical research; principal of a horticultural college; physicians to children's hospitals, and holders of Rockefeller Medical Fellowships, is sufficient proof of the value to them and to the community of their training.

This year a Senior Fellowship has been given to Dr. R. J. Lythgoe, who is working on the special senses, and fourth year Fellowships respectively to Mr. Philip Eggleton, M.Sc., for work on the different types of contractile tissues and their metabolism, and to Dr. F. R. Winton, who is investigating the physiology and pharmacology of urinary secretion at Cambridge.

The Junior Fellowships for 1930 are allocated as follows:—

Frederick Horace Smirk, M.D. Manch., M.R.C.P. Lond. (1) To study the functional pathology and physiology of diuresis from a biochemical standpoint; (2) to study the functional pathology of plethoras, anæmias, and œdemas.

Gordon Roy Cameron, M.B., D.Sc. Melbourne. To complete work on the histological identification of calcium salts in pathological deposits and to commence study of inflammation in invertebrates. Proposes to investigate reaction of tissues of earthworm to foreign bodies, parasites and bacteria.

John McMichael, M.B., M.R.C.P. Edin. For a continuation of present studies on the inter-relationships of liver and splenic disease and on diseases of portal vessels and other vessel changes in liver disease.

Robert Percival Cook, B.Sc. Melbourne, Ph.D. Camb. For a study of bacterial metabolism and its relation to the specific action between host and bacterial parasite. Proposes to study metabolism of various types of bacteria by (1) chemical changes produced during actual growth in chemically defined media; (2) to study the individual enzyme systems of the bacterial cell.

Norman Urquhart Meldrum, B.Sc. Edin. For (1) a study of the so-called reversible denaturation of hæmaglobin. Intends to determine the influence of factors such as dilution, addition of foreign proteins and influence of acidity on the equilibrium between methæmoglobin, globin, and hæmatin; (2) to measure formation of sulphydryl groups in various types of protein denaturation.

David Reginald Piper Murray, B.A.Camb. For a comparison of the two types of proteolytic enzymes characteristic of the tissues and organs and of the digestive tract. Investigation to be based on studies of kinetics.

George Norman Myers, M.Sc., M.B. Durh. The curative action of digitalis, its glucosides and allies, in general toxæmia, and in conditions of shock.

Charles Amos Ashford, B.A. Camb. For studies in (*a*) the metabolism of nervous tissue; and (*b*) mode of action of vitamin D, with special reference to hypervitaminosis D.

Dr. Smirk will work in London at the medical unit of University College Hospital, Dr. Cameron at the Graham Laboratory of University College Medical School. Dr. John McMichael is to work at Aberdeen, in the department of medicine of the University, and Dr. Myers in the Pharmacological Laboratories at Cambridge. The other four new Junior Fellows propose to carry on their research at the Sir William Dunn Institute at Cambridge.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. E. B. Kenny is placed on the retd. list.

The following appointments are notified: Surg. Comdrs. E. St. G. S. Goodwin to *Suffolk*, and P. L. Gibson to *Malabar*, for R.N. Hospital, Bermuda; A. H. Joy to *Pembroke*, for R.M. Infirmary, Chatham; C. H. M. Gimlette to *Dolphin*; and R. A. W. Ford to *Coventry*.

Surg. Lts. T. B. Lynach to *Nelson*; W. D. M. Sim to *Cambrian*; W. V. Beach to *Adamant*; R. L. G. Proctor to *Vivid*, for R.N. Hospital, Plymouth; and T. A. Cochrane to *Greenwich*.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Sub.-Lt. J. D. Lendrum to be Surg. Sub.-Lt.

Surg. Lt. H. M. Willoughby to *Albury*.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. H. M. J. Perry, R.A.M.C., to be a Professor at the Royal Army Medical College.

Col. M. H. Babington, late R.A.M.C., retires on retd. pay.

Col. G. T. Brierley, on attaining the age for compulsory retirement, retires on retd. pay.

Maj. and Bt. Lt.-Col. H. M. J. Perry, from the secd. list, is restd. to the estabt.

Capt. J. C. Coutts to be Maj. (prov.).

Lt. (on prob.) W. A. Y. Knight, from the secd. list, is restd. to the estabt.

ARMY DENTAL CORPS.

Capt. P. E. Brown to be Maj.

Capt. J. L. Garrard to be Maj. (prov.).

Capt. G. A. Ballantyne, relinquishes his comm. on appt. to the R.A.F.

ARMY RESERVE OF OFFICERS.

Capt. W. W. Phillips from Supp. Res. of Offs., to be Capt.

TERRITORIAL ARMY.

Capt. W. A. Jackman to be Maj.

Lt. E. A. L. Murphy to be Capt.

C. N. Suter (late Cadet, Edin. Academy Contgt., Jun. Div., O.T.C.) to be Lt.

Capt. G. Williams resigns his commn.

Lt. J. B. Dedman resigns his commn.

ROYAL AIR FORCE.

Squadron-Leader H. J. Proctor (Major, Army Dental Corps) relinquishes his temporary comm. on return to Army duty.

DEATHS IN THE SERVICES.

Lt.-Col. Sidney Browning Smith, C.M.G., late I.M.S., who, as we announced last week, died on July 13th, after a long illness, at Lyncroft, Otford, Kent, at the age of 63, was the son of Dr. Thomas Browning Smith of Sittingbourne, and was educated at Epsom College and St. Bartholomew's Hospital. After qualifying with the Conjoint diploma he joined the Indian Medical Service and took part in the Chitral operations with Sir Francis Younghusband (mentioned in despatches and medal with clasp). After the Waziristan operations of 1901–02 he was appointed district plague officer at Amritsar and later chief plague officer in the Punjab. He embodied his experiences in this connexion in "Plague in India," which he published in 1904. In the late war he served on the western front and in Egypt (mentioned in despatches and made C.M.G.) and he was the organiser of the Mount Dore Hospital for Indian troops at Bournemouth and the clearing station at Karachi. He retired in 1921.

CORRESPONDENCE

THE INTERPRETATION OF DENTAL RADIOGRAMS.

To the Editor of THE LANCET.

SIR,—The letter by Dr. Brailsford in your last issue ontains several remarkable statements. His suggestion that the conception of dental sepsis as a factor in the causation of general disease was forced on a reluctant and hostile dental profession by the medical profession is a ludicrous travesty of the facts. It is true that the credit for formulating this view was due to Dr. William Hunter. At first, no doubt, his views were received with incredulity by both doctors and dentists, but they very quickly became accepted by both, and it is much nearer the mark to say that Dr. Hunter's work has received the strong support of the dental profession as a whole almost from the first. Over 20 years ago, when I was a dental student, the doctrine of dental sepsis in relation to general disease was vigorously taught at the Royal Dental Hospital, and the cult of the clean mouth practised with equal vigour. Indeed, one may say fairly that for the last two decades in this country the dental profession has accepted Hunter's views as unquestioned in the same way as the doctor has accepted the principles of Listerism. It is true that some dentists have tried to infuse a note of caution because of the many cases they see in which the removal of undoubted dental sepsis has failed to relieve the patient who has thus had the burden of an edentulous mouth added to his other ailments. An uncritical acceptance of a theory is even worse than scepticism, and I would suggest that it is to our credit that we have tried to rationalise Hunter's work and to make the treatment of dental sepsis as a therapeutic measure an instrument of greater precision. The dental surgeons "of repute" (though I have yet to meet them) may be fairly balanced by those doctors who still ignore the significance of dental sepsis.

I fully appreciate the work of radiologists in demonstrating the existence of dental lesions otherwise not easily discoverable, but I would point out that radiology owes much to the pioneer work of dentists in this field, and that many of the advances in the assessment of the significance of dental radiograms has been made by dentists, whether practising radiology exclusively or not. In your editorial you say that dentists in general do not attach much importance to the reports on radiograms. It is truly a commonplace in conversation among dentists that the reports which usually accompany a set of radiograms, while useful no doubt to the medical practitioner, tell the dentist singularly little, and often require considerable correction when correlated with the clinical findings. How many radiologists ever ask the dentist in his turn to furnish a report showing the clinical or post-extraction findings so that he may know how far his interpretations are borne out? I have not heard of any who do this.

Those who study the actual conditions as revealed during the course of treatment know that there is by no means an exact correspondence between these and the appearances shown in the radiogram. If Dr. Brailsford would refer to Weston Price's book on dental infections he will find there an instructive chapter on the capabilities and limitations of X rays. In THE LANCET (1929, ii., 375) Dr. D. A. Imrie, who is a radiologist possessing a dental qualification, tried to correlate the X ray and pathological findings of some cases of dental infection, but such laudable efforts are unfortunately rare. The usual reports obtained from radiologists not possessing the familiarity with dental conditions which a dental training brings with it, follow a stereotyped line. They often contain inaccuracies and reveal clearly that the writers of them are ill-acquainted with the elements of the anatomy and pathology of the teeth and jaws. Dr. Brailsford implies that the dentist who does not limit himself to radiology is technically not equipped to take good radiograms. As a teacher of dentistry I see a large number of dental radiograms, and among them some bad ones. Radiologists, radiographers, and dentists have all contributed bad ones, but I should certainly not say that dentists sin in this respect more than others. On the contrary, dentists who take their own radiograms without specialising in this subject are usually quite competent to do so, and produce radiograms free from distortion, and with the light and shadow well contrasted. I know that dental students soon learn to recognise the essential points in a radiogram. Such an error as that described by Dr. Brailsford, of mistaking a large apical abscess for the antrum must surely be uncommon. I myself have seen the mental foramen solemnly described as an abscess in a report by a radiologist. I have seen a cyst involving an upper lateral incisor and showing as a large area of rarefaction in the film, overlooked in the radiologist's report, because it had evidently been mistaken for the antrum, though a very elementary knowledge of the anatomy of the jaws should have made it clear that the antrum does not extend to the incisor region. But recriminations of this sort are not very helpful. I look forward to a time when every dentist will possess his X ray apparatus just as he possesses a dental engine, for apart from the routine examination of the mouth for the investigation of dental sepsis, radiograms are very helpful in the everyday routine of dental practice, and the dentist who cannot take his own radiograms is undoubtedly handicapped. The radiologist who takes really fine radiograms and can accompany them with a report which is accurate and helpful will always find plenty of dental work referred to him both by doctors and dentists. I regard Mr. Henry's articles as conveying an extremely lucid exposition of a difficult subject, the more valuable because of his all-round knowledge of dental surgery and pathology.

I am, Sir, yours faithfully,

Brook-street, W., July 19th, 1930. A. T. PITTS.

MENINGO-ENCEPHALITIS AND HERPES ZOSTER.

To the Editor of THE LANCET.

SIR,—Apropos of the article in THE LANCET of July 12th by Drs. Schiff and Brain, entitled "Acute Meningo-encephalitis associated with Herpes Zoster," you may be interested in the following account of a case I saw for the first time a week ago.

A healthy looking married woman of 30 went to her doctor on June 18th complaining of weakness in the right arm and numbness and tingling in the fingers of the same side which had spread up the arm as far as the shoulder. On the 25th she was somewhat better; the abnormal sensations being confined to the thumb, index, and little fingers. On the 30th the whole forearm was involved, but

the greatest amount of paræsthesia was still in these fingers. In addition there was a patch of herpes over the seventh cervical vertebra. On July 6th pain developed in the right heel accompanied by numbness, still present on the 11th when she saw me.

I found herpes over the seventh cervical vertebra as stated and also in front over the right sterno-clavicular joint, with a few vesicles extending across the mid-line. The face was normal. There was marked weakness in the right grasp and in the triceps. There was anæsthesia to light touch, to vibration, to temperature, and to pinprick from the tips of the fingers to the upper arm at shoulder level. In addition there was definite wobbling in the finger-nose test on that side. The right leg showed similar sensory changes as high as the knee. I could detect no ataxia in the leg; the heel was painful to stand on. The reflexes were all normal; the abdominals could not be elicited. The left side was normal.

There had been a certain amount of headache since the illness began but not at all severe. There had been no eye trouble, and she was feeling much better than she had been.

I saw the patient again to-day, when I found that marked improvement had taken place. The anæsthesia was confined to the right thumb and index; the grasp was still weak but greatly better than a week ago. An examination of the C.S.F. was not done; it did not seem worth while in an illness already over three weeks old when I first saw the patient.

I am, Sir, yours faithfully,

Coventry, July 18th, 1930. W. FRASER ANNAND.

EFFECT OF RADIUM ON CARCINOMA.

To the Editor of THE LANCET.

SIR,—The question whether it is possible to stimulate malignant cells by means of irradiation, and if so, whether that stimulation is direct or indirect, is still in dispute, but every surgeon, I think, will agree that if a malignant growth is cut into with a knife, needle, or any other instrument, cells may be disseminated, and, moreover, their actual growth may be stimulated by the tissue juices created as a result of the trauma.

Mr. Romanis, in his interesting note, has not excluded these possibilities, and I would suggest therefore that the only thing he can deduce is that the radium did not kill the cells that were in the track of the needle. If radium plaques had been used and the growth had been increased near those plaques, there would have been more justification for assuming that irradiation could in some cases stimulate malignant growth.

I am, Sir, yours faithfully,

Harley-street W., July 19th. MALCOLM DONALDSON.

CONGENITAL ATRESIA OF THE ŒSOPHAGUS.

To the Editor of THE LANCET.

SIR,—A few days before Dr. Polson's paper on atresia of the œsophagus was published in your last issue I attended at the delivery of a child that presented this as well as several other congenital abnormalities. He was born on July 12th, at full time after a pregnancy and labour that presented no abnormality of note. The mother was a primipara, aged 22. The baby appeared to be fairly healthy at birth and weighed 6½ lb. A few hours after birth it seemed to have considerable difficulty with respiration and quantities of rather viscid froth were brought up with difficulty. At intervals it became cyanosed. The quantity of froth prevented any attempt at feeding. On account of an imperforate anus the child was removed to Rochford Hospital, where Dr. Newey attempted to find the rectum by the perineal route but without success. The child died on July 15th. The following day I was present at an autopsy carried out by Dr. Newey. The condition of the œsophagus was almost exactly as shown in the illustration given by Dr. Polson. In my case there was not so much hypertrophy and dilatation of the upper portion as he shows, and the lower portion opened into the trachea at the level of the bifurcation. In addition the child presented the following congenital abnormalities: (1) imperforate anus with complete absence of the rectum, the pelvic colon ending blindly; (2) hydronephrosis of the right kidney with no connexion between pelvis and ureter; (3) patent foramen ovale; (4) absence of the right thumb; and (5) abduction of the right hand at the wrist. The lungs showed a marked degree of interstitial emphysema arising apparently from the difficulty with respiration.

I am, Sir, yours faithfully,

C. P. DONNISON, M.B., B.S. Lond.

South Benfleet, Essex, July 21st, 1930.

THE OUT-PATIENT QUEUE.

To the Editor of THE LANCET.

SIR,—The cure of the overcrowded out-patient department to which you referred last week is largely in the hands of the management of the hospital. It is the indiscriminate welcome accorded to all and sundry who apply for treatment that is at the root of the trouble. I would suggest that, except for emergencies, no patient be seen in an out-patient department unless he brings a letter from a doctor or proves that he is not insured under the National Health Insurance Act, and is too poor to afford even the most modest doctor's fee.

I am, Sir, yours faithfully,

Westbourne Park-road, W., July 19th. J. COHEN.

THE PROPER STRAPPING OF THE CHEST.

To the Editor of THE LANCET.

SIR,—Dr. C. W. Chapman, in his letter on Left Inframammary Pain which appears in your issue of June 28th (p. 1434), properly calls attention to the value of strapping of the chest in those cases where the pain is manifestly made worse by the movements of respiration. But in his description of how strapping should be done he leaves out the important point that the strips should be drawn tight and pressed firmly into position while the patient's chest is in the position of *full expiration*. Unless this detail is attended to, the movements of the side are little affected by the presence of strapping on the surface. Another point not mentioned, but no doubt assumed, is that the straps should run horizontally round the side of the chest, thus crossing the lines of two or more ribs, and so increasing the fixation aimed at.

I feel like apologising, Sir, for thus mentioning such apparently small points, but it is the attention to details in many therapeutic measures that makes all the difference between success and failure.

I am, Sir, yours, faithfully,

Toronto, July 8th, 1930. R. D. RUDOLF.

OPENING OF BETHLEM ROYAL HOSPITAL.—The new hospital at Monk's Orchard, Beckenham, of which the foundation-stone was laid in July, 1928, by Prince Arthur of Connaught, was opened by the Queen recently. The hospital, which has cost £450,000, stands in its own park of 200 acres, a few minutes' walk from Eden Park station (S.R.) and on the ten mile circle drawn round Charing Cross. Patients will for the most part have separate bedrooms, with a few four- and five-bed wards for special purposes. The move from Lambeth will soon follow. The cost of laboratories for routine and research work has been met by a gift from Lord Wakefield.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

HEALTH ADMINISTRATION IN SCOTLAND.

THE House of Commons on July 14th considered in Committee of Supply a vote of £1,651,592 to complete the sum of £2,791,592 required for the salaries and expenses of the Department of Health for Scotland. Mr. HERBERT DUNNICO was in the chair.

Mr. ADAMSON (Secretary of State for Scotland), in moving the vote, referred to a few of the outstanding figures in the vital statistics for 1929. He said the birth-rate was 19·02, the lowest since compulsory registration was introduced in 1855. The death-rate was 14·5 per 1000, slightly higher than in the previous year, but this was influenced by an epidemic of influenza in the first quarter, during which respiratory diseases had an adverse effect on the infantile mortality —86·8 per 1000 births. The maternal mortality-rate for 1929 was 6·9 per 1000 births, as compared with 7·0 for the preceding year, the schemes of maternity and child welfare showing little result. Investigations were being made into all deaths of married women during pregnancy, or within four weeks of its termination. There was already a quite definite indication of the need for more complete medical supervision. An effort would be made to secure an adequate antenatal service under the Local Government (Scotland) Act, 1929. But the mothers themselves must coöperate by making a fuller use of the services provided, and this would have to be secured by stimulating their interest in these services through education.

DECLINE OF TUBERCULOSIS.

Here he was able to present a more encouraging picture. The death-rate from all forms of tuberculosis, 94 per 100,000 of the population, was the lowest yet recorded, being 3 per 100,000 less than the record figure for 1928. Actually 4579 persons died from tuberculosis in 1929, whereas in 1919 the figure was 6376.

THE COST OF MEDICAL BENEFIT.

He pointed to the value of improved diagnosis and extended institutional treatment, but said that the amounts expended by approved societies in sickness and disablement benefits were still abnormally high. In 1929 the amount so expended was £1,924,000, or an increase of £200,000 over the corresponding figure for 1928. The severe epidemic of influenza in the early months of 1929 would account for some part of the increased expenditure. But after making allowance for this, and for a slight increase in the number of insured persons at risk last year, there remained a considerable part of the increase for which no satisfactory explanation was available. The department had been in conference with the approved societies and with a special committee of the Insurance Acts subcommittee of the British Medical Association, but it had not hitherto been possible to publish accurate statistical information concerning incapacitating illness among the insured. Now, however, they had put into operation, on July 1st of this year, a scheme for collecting complete and trutsworthy data from the approved societies from which might be compiled statistical records, inter alia, (1) the incidence of the various incapacitating diseases and their duration, not only for insured persons generally, but for groups of insured persons arranged according to area of residence, occupation, age, &c.; and (2) the extent to which individual medical practitioners were granted certificates of incapacity for work. The scheme was considered recently at a conference between the department and representatives of the larger approved societies in Scotland, who promised coöperation. It was hoped that the morbidity statistics, when published, would be of great advantage to the local authorities.

Sir ROBERT HAMILTON said they had recently passed an Act to put the Highlands and Islands Medical Fund on a stable basis. There was no fund of its size which was so well administered, or which did so much good over so large an area. But in looking into the figures he had been disappointed.

HOUSING PROGRESS.

Dealing with the housing question in Scotland Mr. ADAMSON said that up to May 31st, under all forms of State assistance, 110,136 houses, accommodating 495,000 people—a ninth of the working-class population of the country—had been completed, but 100,000 more houses were required. The average reduction in cost under falling prices was estimated at £75 per house, and the new county councils in Scotland had been urged to see that the utmost advantage was taken by rural owners of the Housing (Rural Workers) Act, 1926. He looked forward to activity from the local authorities when the Slum Clearance Bill became law.

Sir JOHN GILMOUR referred to his personal responsibility for the changes now taking place, for which he said no claim was made that they were unalterable. There was now an opportunity for coördination and linking the health of the child from earliest years through school-days and from school-days onward. If the health of the child only were assisted by the new coördination the Act would be justified. There was an obligation now on Parliament to set aside year by year whatever sum might be necessary for carrying out health services in the north of Scotland in addition to the £42,000 provided under the 1913 Act. There was a total of £72,000 provided in the present estimates. Last year £74,800 was available, and with the extension of the services he found the provision insufficient. He hoped the Government were not intending to contract the finances of the fund, but were rather looking forward to its expansion. The extension of the nursing services in the country districts in the north of Scotland had been invaluable. But the difficulty of the nurses getting about was very considerable, and he was glad that the department proposed that in future they should be supplied with light cars. Another direction in which very useful work had been done by the fund was in helping to build doctor's houses. But there were one or two cases where delay had taken place in this respect. He called particular attention to the case of the island of Whalsay, in the Orkneys, where a doctor's house was not yet built, and the doctor on the island had been living in most uncomfortable conditions. Another piece of useful work which the department had done was in putting doctors' houses on the telephone. The department had subscribed the money and had thus got over the parsimony of the post-office in the interests of humanity. The department should insist that every doctor in a country parish where there was a telephone service should be put upon the telephone. Referring to the position of the hospital in Lerwick, Sir R. HAMILTON said a considerable sum was raised annually—as much as the poverty of the people would allow—in order to enable that hospital to keep going. But since the Government department had given the services of a consulting surgeon the hospital had become almost full of surgical cases, and there was practically no room for ordinary medical cases. All the surgical cases which used to go to Aberdeen and Edinburgh were now being dealt with locally. He wished to ask the Secretary of State for Scotland whether it was possible to make a grant from the fund for the extension of a local country hospital which was doing such magnificent work.

Mr. MCGOVERN urged that the Secretary for Scotland should at the earliest possible moment call a conference of all public assistance committees in Scotland with a view to dealing with the totally inadequate scales of relief to unemployed workers.

Mr. MACQUISTEN suggested that there were in the Highlands a great many manses, and while it appeared difficult to get the lad of parts to go in for the Church, it occurred to him that there might be a combination in many of the districts of the Highlands of the clergyman and the doctor, with the manses as residences.

Mr. MACPHERSON said he wished to plead for the class of hospital such as the Invergordon Hospital —a sanatorium hospital. He was anxious that the good work started locally by local authorities should be assisted where necessary by the Government. The hospital at Invergordon was exceedingly well managed, and he could say the same about every other hospital of that class. There were the Ross Memorial Hospital at Dingwall and the Northern Infirmary at Inverness. They had established under the ægis of the Department of Health a specialised service of highly skilled consultants and surgeons. By developing the hospital system in the north of Scotland they were easing the burden of the hospitals in the south, and benefiting not only the local community but the community as a whole. He hoped that they would have an assurance from the Government that they would not only maintain the grant of £72,000 for the Highlands and Islands Medical Service, but if need arose they would persuade the Chancellor of the Exchequer to add to the guarantee.

Mr. HARDIE, referring to Mr. Macquisten's suggestion, said that if a man was fit for medical work he must concentrate on medical science, whereas if he was fit as a spiritual adviser he must confine himself to spiritual subjects.

Mr. R. W. SMITH said he hoped the Government would see that school teachers considered it part of their duty to see that school-children were clean and tidy, ensuring thus that mothers would be more willing to visit the maternity welfare centres.

Mr. RAMSAY said that the question of the delegation of health services to the island of Lewis had caused something like a deadlock for a considerable time. The county councils of Inverness and Argyll had delegated the health service to a specific committee belonging more or less to the islands of these two counties, but unfortunately the people of Lewis had not received a similar delegation. He hoped that the Under Secretary would give them an assurance that something would be done in this respect, because it was a serious thing from the health point of view in Lewis. The late Government and the present Government had done splendid work for Lewis in establishing the Lewis Hospital, but he wished that provision were made for more ambulances and stretchers. A recent case was brought to his notice of a man suffering from peritonitis who died, largely because no near ambulance or stretcher was available to take him to hospital.

Mr. LOVAT-FRASER called attention to the dental service in the Highlands and Islands, and urged that further provision should be made in that respect.

Major ELLIOT, referring to the general improvement of public health in Scotland and especially to tuberculosis figures, pointed out that, while water-borne diseases had been practically conquered and food diseases were in the way of being conquered, air-borne diseases were still completely unsubdued. He referred to the incidence of epidemics among crowded and tenement populations, and pointed out that, taking pre-school children into account, broncho-pneumonia, measles, and tuberculosis accounted for 57 per cent. of the deaths. To clean up the air would take a long time, but lung diseases especially were a sign of lowered resistance. While other figures showed that the fundamental resistance of the race was not being safeguarded, attention would give the best results if focused on the child. If they had not a sound child between the ages of 1 and 5, it was useless to try to pump education into such a child between 14 and 16. The report to the department spoke of defective vision as the greatest difficulty in the matter of the school-child. As a sufferer from defective vision, he was quite sure that rheumatism, toothache, or anæmia constituted the greater prejudice to the absorption of knowledge. Scotland, it appeared, had turned largely towards preserved foods, and the necessity of studying these products scientifically stood out. During the last ten years the poor-law authorities had spent ten millions on the purchase of food for the poor-law population of Scotland without any examination of the principles governing dietetics. He referred to the physiological value of the generally rough food on which our ancestors lived.

Mr. JOHNSTON (Under Secretary of State for Scotland), replying to the debate, said it was far too early to say how the new Local Government Act was being fitted into the machinery of local government in Scotland. The machinery creaked a little here and there. It creaked rather badly in Lewis, and they had considerable difficulty in fitting in the desire of the people for local government and financial autonomy, with considerable State subventions, with the control which was being exercised by the county council of which it formed a part. But it was fair to say that the Act was working with considerable facility and smoothness taking the country as a whole. With regard to St. Kilda, the evacuation of which had been discussed, the Government would take every possible step to see that the people were accommodated in future in better surroundings. The poverty under which they had lived was almost indescribable, and they were faced with famine. Had it not been for the Queen's nurse, who stayed in the island during the last two winters, Heaven knew what tragedies would have occurred. He could assure Sir R. Hamilton that the department had every sympathy with the point of view he had expressed, and they were not at all desirous of cutting down the expenditure in respect of the Highlands and Islands Medical Fund. They proposed to assist telephones in the rural areas. The Secretary of State and he had been giving the question of calling a conference of public assistance committees to discuss the equalisation of the present scales of relief, particularly so far as they applied to children, very serious consideration. He would not follow Mr. Macquisten in his irrelevant but rather humorous dissertation upon medical missionaries among the aborigines of the West Highlands. They were sending inspectors to local authorities, and doing everything in their power to induce them to make the maximum effort to improve rural housing in Scotland. He agreed with Major Elliot that they were making very considerable progress in public health, not only in regard to tuberculosis, but along other lines. They were making some progress in regard to nutrition, and if their milk experiment succeeded they would make a great advance in that direction. They were also making progress in regard to fresh air. There was nothing which the Secretary of State was conscious of having left undone in the new Housing Bill to wipe away the slums in Scotland, and to secure a healthier environment for the next generation.

The vote was agreed to.

THE HOUSING (SCOTLAND) BILL.

The Housing (Scotland) Bill was considered on report in the House of Commons on Tuesday, July 15th.

On the motion for the third reading of the Bill,

Mr. ADAMSON (Secretary of State for Scotland) said the discussions had shown that in its main structure the measure was generally acceptable to the House and also to the local authorities. A number of suggestions had been put forward from all sides of the House for its improvement, and the Government had met to a very large extent the representations of members of the opposition. The Bill, in the main, however, so far as the procedure for

dealing with slum areas and individuals in insanitary houses were concerned, remained substantially unaltered. He was satisfied that the terms of the new grant were much more favourable to the local authorities than the present grant, and that in practice it would be found that the terms were exceedingly generous. They had been so designed as to offer the greatest inducement to local authorities to erect the larger sized houses which were so badly needed in Scotland for the rehousing of families. He appealed to the local authorities that they should at once proceed actively to put their powers into operation, and wipe away the reproach which had so long rested on Scottish housing.

Major ELLIOT said that it was not possible for Scotland to call itself civilised so long as children were kept awake by vermin, or walls were allowed to be built in front of windows so that it was not possible to see the light of day, and people had to burn gas throughout the 24 hours. But these great evils could not be remedied by State action alone. In many ways the housing conditions in England were an example to Scotland. What was improving and saving the situation in England was the great programme of unassisted houses which was being carried out south of the Border, and unless Scotland could get this assistance into her housing problem it would lag behind England in reaching a solution.

Dr. FORGAN congratulated the Government on producing in this Bill easily the best measure of the present Parliament. The simplification of machinery would enable local authorities, should they so wish, to proceed at a more rapid rate with the demolition of slums and with an attempt to deal with overcrowding. Overcrowding in Scotland was incomparably worse than in England. There were 98 per cent. of those living more than four in a room who were living in either one or two-roomed houses; of those living more than three in a room, 90 per cent. were housed in either one- or two-roomed houses; and of those living more than two in a room 77 per cent. were in one- or two-roomed houses. This Bill compelled local authorities to face the facts of the situation. There was to be a survey at once, and then another three years hence, and subsequently one every five years. In the past local authorities had been content to rely on old statistics. The more stringent the local authority made its standard of housing the bigger the grant which it would be able to earn in an improvement area.

After further debate,

The Bill was read a third time.

In the House of Lords on Tuesday, July 22nd, the Housing (Scotland) Bill, which has passed through the House of Commons, was read a second time. On the same day the Commons amendment to the Workmen's Compensation (Silicosis and Asbestos) Bill was agreed to.

INSURED PERSONS AND OPHTHALMIC BENEFIT.

On Tuesday, July 15th, in the House of Commons, Mr. WOMERSLEY moved "That an humble Address be presented to His Majesty praying that Regulation 25 of the National Health Insurance (Additional Benefits) Regulations, 1930, dated 18th June, 1930, be annulled." The portion of the regulation to which he raised objection read as follows:—

"Where a member has submitted himself to the examination of a medical practitioner under the scheme of a body or organisation which provides both ophthalmic examination and optical appliances, he shall not be entitled to obtain the appliance prescribed by such practitioner from an optician who is not associated with that body or organisation."

Under the present arrangements, the hon. Member continued, there was a body of qualified opticians known as the Joint Council of Qualified Opticians. They had been prescribing for some considerable time for members of approved societies, and the arrangement had worked very satisfactorily indeed. Now, however, the ophthalmic surgeons had set up the National Ophthalmic Treatment Board, and they had taken on to that Board certain firms who supplied optical glasses, with a request to the Ministry of Health that special privileges should be given to the Board. The speaker went on to say that although the fees under the new arrangement had been lowered, the number of opticians was insufficient, and, as there was no complaint against the previous methods of carrying on the work, the approved societies wanted to know the reasons for the change.

Mr. BIRD, in seconding the motion, spoke generally of the position of those who had passed the examination of the British Optical Association or that instituted by the Company of Spectacle Makers.

Mr. GREENWOOD (Minister of Health) said that arrangements for additional benefit must be dealt with by the Regulations, which were formulated after full consultation with the Approved Societies Consultative Council of the Ministry. He was not concerned with differences of opinion between the medical profession and the Joint Council, save that he would hold the balance as fairly as he could. Any approved society would be free to make its normal arrangements if it was providing ophthalmic treatment directly with a representative body of opticians, and in the vast majority of cases that was the course which would be followed. The leading organisation of opticians was the Joint Council of Qualified Opticians. The British Medical Association had made two alternative schemes with a view to making it possible for societies to get advice from ophthalmic surgeons with a minimum of cost. In the first scheme they had prepared a list of medical practitioners who had experience of dealing with ophthalmic cases and were willing to test the sight of insured persons and prescribe glasses. Under this scheme the insured person, having got his prescription, could go to any qualified optician throughout the country. The second scheme was a combined one, and was an arrangement between the medical profession on the one hand and a body not representing a large number of firms, the Association of Dispensing Opticians, on the other hand; firms, he imagined, to which most members of the House of Commons went when they had their prescriptions made up. They were people who never prescribed, but always made up prescriptions from ophthalmic surgeons. Under that combined scheme it was quite clear they could not have that free choice of opticians which they had under other schemes. But the insured person need not adopt this scheme unless he wanted to. There was no hardship in that. He was not prepared to accept entirely the medical view, or the view of the Joint Council. While there might be many cases which might be attended to by the Joint Council there might be many other cases where skilled advice was imperative, but the two bodies would meet everybody's needs. He hoped the House would not be so ill-advised as not to permit these Regulations to go through, but would allow them to pass as provisional Regulations designed for the benefit of insured persons.

Mr. RHYS DAVIES protested against the limit of choice given to the insured in the matter of ophthalmic treatment, but Dr. MORRIS-JONES said that if the Regulation were deleted it would take away what opportunity for choice there was; and after further discussion the motion for an address praying that the Regulations should be annulled the motion was rejected by 144 votes to 23.

WORKMEN'S COMPENSATION (SILICOSIS) BILL

On the motion for the third reading of the Workmen's Compensation (Silicosis) Bill, in the House of Commons on July 15th,

Dr. VERNON DAVIES said that many men who had been in the industry for 15 or 20 years would show on examination signs of silicosis, and in that case employers might use that as a means of dismissing them in order to avoid future compensation.

If a workman was compulsorily suspended before he became disabled would he be entitled to compensation?

After further debate,

Mr. SHORT (Under Secretary to the Home Office) said that so far as he was aware there had been no complaint in connexion with the various schemes in operation respecting dismissals from the causes indicated by Dr. Davies. At the same time it was possible under Section 47 of the Workmen's Compensation Act to cover the two points.

The Bill was read a third time.

HOUSE OF LORDS.

THE SLUM CLEARANCE BILL.

On Monday, July 21st, The Housing (No. 2) Bill passed through Committee.

HOUSE OF COMMONS.

THURSDAY, JULY 16TH.

Unhealthy Labour Conditions in East London.

Major NATHAN asked the Minister of Labour whether she was now in a position to make a statement regarding the sweated wages and unhealthy conditions of labour among many out-workers in East London, and particularly in the boot and shoe industry.—Miss BONDFIELD replied: The inquiries by my Department with regard to wages in the boot and shoe trade in East London are still in progress, and will not be completed for some time. The question of unhealthy conditions of labour is one for the Home Office.

Sale of Poisonous Drugs from Automatic Machines.

Dr. MORRIS-JONES asked the Home Secretary whether he was aware that drugs of a poisonous character could be procured from automatic machines outside chemists' establishments in the county of London; and whether, in view of the Poisons and Pharmacy Act, 1908, and the danger involved to the public, he would cause such vendors to be prosecuted.—Mr. CLYNES replied: I have seen in the press the report of a case in which the legality of such sales was raised, and the Judge decided that they involved a breach of Section 3 of the Poisons and Pharmacy Act, 1908. The proceedings for the recovery of a penalty under that section are of a civil character, and are instituted by the Registrar of the Pharmaceutical Society, and I have no power to intervene. I understand the case in question was arranged by the Pharmaceutical Society for the purpose of testing the legality of such sales, and the judgment will, no doubt, be taken note of by those concerned.

Street Accidents to Policemen in London.

Mr. HACKING asked the Home Secretary the number of police officers engaged on regulation traffic in the Metropolitan police area who had been either killed or injured during the past 12 months; and whether all officers engaged upon this duty are compelled to wear white sleeves.—Mr. CLYNES replied: 171 officers were injured, none fatally. Officers engaged on this duty are required to wear the white gauntlets provided, but it occasionally happens that an officer has to take up traffic duty at short notice without gauntlets.

Malnutrition among School-children.

Mr. MCSHANE asked the President of the Board of Education if he would institute comparative medical examinations of representative samples of school-children, of men who had been for some time unemployed, and of men belonging to the regularly employed artisan class.—Sir CHARLES TREVELYAN replied: Apart from the practical difficulties involved I doubt whether the investigation suggested would lead to any useful results. I may, however, point out that it is the duty of local education authorities, as part of the ordinary work of the school medical service, to discover whether children are suffering from malnutrition, and that in areas where industrial depression is acute special steps are taken to keep a close watch on the health of the children and to provide supplementary nourishment in cases of need.

Poison Gas Experiments on Living Animals.

Mr. FREEMAN asked the Secretary of State for War whether he had any evidence showing that poison gas and other experiments on living animals being conducted at Porton threw any light on the effects of such poisons on human beings.—Mr. T. SHAW replied: The results which have been obtained both during and since the Great War show that experiments on animals at Porton give definite evidence of the mode of action of poison gases on human beings. Indications are also obtained of the curative treatment which should be adopted, and I am advised that the knowledge thus gained resulted in great alleviation of human suffering during the Great War.

Medical Attention for Families of Naval Men.

Mr. HORE-BELISHA asked the First Lord of the Admiralty what arrangements were in force for providing medical attention for the families of officers and men in the Navy.—Mr. AMMON (Parliamentary Secretary to the Admiralty) replied: The families of officers and men in the Navy are not entitled to medical attention at the public expense. As a privilege, however, the families of Naval personnel serving in particular appointments in certain shore establishments and the families of Royal Marines resident in barracks are afforded free medical treatment by the medical officer of the establishment subject to certain conditions, one of which is that no extra expense to Navy Votes is thereby entailed. As an exceptional measure, a contribution from Naval Funds is also made in approved cases towards the cost of the treatment afforded, either in the Military Hospital or in the King George V Merchant Seamen's Hospital, Malta, to the British wives and families of ratings who, having joined the Navy in the United Kingdom, are temporarily resident at Malta while serving on the Mediterranean Station. Assistance has also been given by means of a grant from the residue of the Naval Prize Fund to enable them to obtain out-patient treatment and medical attention in their own homes at reduced rates. This latter privilege is applicable also to families of Officers.

Tuberculosis in the Navy.

Mr. MARKHAM asked the First Lord of the Admiralty how many stokers or engine-room artificers had been invalided with tuberculosis from the Royal Navy during the past year.—Mr. AMMON replied: The numbers of stokers and engine-room artificers invalided from the Royal Navy on account of pulmonary tuberculosis during the year Jan. 1st–Dec. 31st, 1929, are as follows:—

Chief Stokers ..	2	Chief Engine-room Artificers	4
Stoker Petty Officers	11	Engine-room Artificers ..	11
Leading Stokers ..	10	Engine-room Artificer Apprentices	2
Stokers	35		
	58		17

Deaths from Small-pox.

Mr. BROAD asked the Minister of Health what were the latest figures showing the number of small-pox deaths registered in France, Germany, Italy, Switzerland, Spain, Austria, Norway, Sweden, Denmark, and Russia.—Mr. GREENWOOD replied: According to the official returns received from the countries in question, no deaths from small-pox were registered during the year 1929 in Germany, Switzerland, Austria, Norway, Sweden, or Denmark, while three deaths occurred in Spain. According to the figures published by the Health Section of the League of Nations there were no deaths from small-pox in France during 1929, while five deaths occurred in Italy during 1927, which is the latest year for which information is available in respect of that country. No particulars are available in regard to deaths from small-pox in Russia.

Medical Examination of War Pensioners.

Mr. STEPHEN asked the Minister of Pensions if he was aware that an applicant for increase of pension on the ground of deterioration was not granted a full medical board; under what regulation such claims were considered only by one medical officer; and if he would take steps to see that a full medical board was granted in each case, and that the man's own medical adviser, who was fully conversant with the man's condition, was consulted before a decision was arrived at.—Mr. F. O. ROBERTS replied: Medical examination and certification may, under the terms of the Warrant, be carried out by one or more medical officers, according to the circumstances of the case. The class of case to which my hon. friend refers is one in which examination by an experienced medical officer is normally sufficient, though a specialist or another medical officer may be associated with him where necessary. Opportunity is given, especially where an applicant has been recently under the care of his private practitioner, to furnish any statement from such practitioner, and full consideration is always given to the statement, but it would not be practicable or necessary to adopt the practice suggested by my hon. friend in every case.

MONDAY, JULY 21ST.

Deaths from Small-pox.

Mr. GROVES asked the Minister of Health how many deaths from small-pox occurred in the year 1929; the ages of the cases; and the vaccinal condition of each case.—Mr. GREEN-

WOOD replied: During the 52 weeks ended Dec. 28th, 1929, 39 deaths occurred in England and Wales which were classified to small-pox. The ages and vaccinal condition of these cases are shown in the following table:—

Age.	Vaccinal condition.	Age.	Vaccinal condition.
3 days.	Unvaccinated.	34 years.	One unvaccinated,
14 ,,	,,	(2 cases).	One vaccinated.
3 weeks.	,,	36 years.	One unvaccinated.
(2 cases).		(2 cases).	One vaccinated.
1 mth.	,,	37 years.	Unvaccinated.
2 mths.	,,	42 ,,	Vaccinated.
8 ,,	,,	43 ,,	,,
(2 cases).		44 ,,	Unvaccinated.
16 mths.	,,	45 ,,	Vaccinated.
2 years.	,,	(2 cases).	
9 ,,	,,	59 years.	,,
13 ,,	,,	61 ,,	,,
14 ,,	Vaccinated.	63 ,,	Unvaccinated.
16 ,,	Unvaccinated.	64 ,,	,,
17 ,,	,,	65 ,,	One vaccinated.
20 ,,	Vaccinated.	(2 cases).	One doubtful.
24 ,,	Unvaccinated.	66 years.	No information available.
25 ,,	,,	74 ,,	Doubtful.
28 ,,	Vaccinated.	75 ,,	Vaccinated.
29 ,,	,,		

I may add that all the vaccinated persons had been vaccinated in infancy only and, as the table shows, they were aged 14 years and upwards at the date of death.

Residential Treatment for Tuberculosis.

Mr. DAY asked the Minister of Health the latest available figures of persons undergoing residential treatment for tuberculosis from the local authorities in England and Wales, and the number of persons awaiting admission to sanatoria at the same date.—Mr. GREENWOOD replied: The number of patients receiving residential treatment for tuberculosis under the approved schemes of local authorities in England and Wales on the 1st July, 1930, was 22,575. The number who, on the same date, had been awaiting admission to residential institutions for more than ten days was 3232.

Recruitment for Indian Medical Service.

Major GRAHAM POLE asked the Secretary of State for India what action the Government proposed to take in regard to the resolution passed at the conference of representatives of the provincial governments and the medical faculties convened at Delhi in June, requesting the Secretary of State to change the rules governing recruitment to the Indian Medical Service, so as to remove the provision that only persons holding degrees recognised by the General Medical Council in this country might be selected for the Indian Medical Service.—Mr. WEDGWOOD BENN replied: I have not yet received the Government of India's views.

Lieut.-Colonel FREMANTLE asked Mr. Benn to do everything he could to insist that in any such change of rules there would be no degradation of the service that had done so much and was expected to do so much by keeping its standard up to the European standard.

Mr. BENN: I can make no statement until I have seen the views of the Government of India.

TUESDAY, JULY 22ND.

Poison Gas Experiments with Animals.

Mr. FREEMAN asked the Secretary of State for War what evidence he had, and how it was obtained, that the experiments conducted at Porton of poison gases on animals showed that those gases had the same effects on human beings.—Mr. T. SHAW replied: A comparison of the gross and microscopic appearance of the lungs of men killed by irritant gases in France with those of animals exposed to the same substances showed that the injuries were of similar nature and character, and further study of such animals gave evidence of the mode of action of the poisons and their effects on vital organs. It was thus possible by correlating these experiments with clinical observations on gas patients to formulate curative treatments. Descriptions and results of this research were published in the medical press shortly after the war.

Calmette Prophylactic Treatment.

Mr. FREEMAN asked the Minister of Health whether he was yet in a position to state the result of the inquiries of the representatives of the Medical Research Council into the death of 20 infants in Lübeck, Germany, following the Calmette prophylactic treatment.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: No, Sir. My right hon. friend has no information at present beyond that contained in the answer given to my hon. friend on the 8th instant.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 12TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 138 (last week 156); scarlet fever, 1776; diphtheria, 1287; enteric fever, 85; pneumonia, 533; puerperal fever, 39; puerperal pyrexia, 86; cerebro-spinal fever, 13; acute poliomyelitis, 11; acute polioencephalitis, 3; encephalitis lethargica, 16; dysentery, 8; and ophthalmia neonatorum, 107. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 15th–16th was as follows: Small-pox, 229 under treatment, 4 under observation (last week 281 and 11 respectively); scarlet fever, 1773; diphtheria, 2003; enteric fever, 32; measles, 326; whooping-cough, 75; puerperal fever, 27 (plus 13 babies); encephalitis lethargica, 121; "other diseases," 19. At St. Margaret's Hospital there were 13 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 18 (5) from measles, 7 (0) from scarlet fever, 11 (4) from whooping-cough, 27 (3) from diphtheria, 44 (12) from diarrhœa and enteritis under two years, and 16 (1) from influenza. The figures in parentheses are those for London itself.

Five fatal cases of diarrhœa were reported from Birmingham, 4 from Liverpool, and 3 from Hull.

The number of stillbirths notified during the week was 272 (corresponding to a rate of 38 per 1000 births), including 51 in London.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NEW YORK STATE WOMEN'S HOSPITAL.—Last year this hospital treated 2527 ward patients at a cost of $6·444 per head per day; private room patients cost $7·698 per day. In-patients of both categories reached a total of 5416, and there were 8315 out-patients. The service for the reception of visitors has been greatly improved by the appointment of a hostess. There were 1609 obstetrical cases, and 1342 babies were born, with a maternal mortality of ·87 per cent. and an infant mortality of 2·64 per cent.

OCCUPATIONAL THERAPY FOR MENTAL CASES.—The report for last year of the medical director of the Bloomingdale Hospital, White Plains, New York, shows that of the 224 patients (110 men and 114 women) who were discharged, 59 were fully recovered, 33 much improved, and 62 improved. The average period of treatment of the recovered was 7 months and 21 days, and of those improved 9 months and 29 days. A considerable number of those discharged are kept under observation by means of visits to the hospital, an arrangement which is found to be "of great value in aiding them to complete their adjustments and to seek early advice in the event of the return of any unfavourable symptoms." All patients whose condition permits go to the occupational therapy buildings for regular periods each day. Over 28,000 articles were made or repaired by them, and in addition the printing office turned out 467,000 pieces of printed matter, including a number of pamphlets of value to the medical, nursing, and therapeutic services. "It is found that the actual accomplishment of some worth-while piece of work gives the best results in this form of treatment."

OBITUARY

HENRY FRASER, M.D. Aberd., M.R.C.P. Lond.

Dr. Henry Fraser, who died suddenly on July 17th, while on holiday at Pitlochry, Perthshire, was born in Aberdeen in 1873, and received his preliminary education there. After a brilliant career as a student of medicine in Marischal College, he graduated M.B., Ch.B. from the University of Aberdeen in 1900. He was awarded the Anderson Research Scholarship, and in the two years following graduation studied pathology at Berlin and Halle. On his return to Aberdeen he proceeded to the degree of M.D. and the D.P.H., in 1902.

Fraser's inclination was towards the investigation of disease rather than medical practice. By reason of his training in pharmacology, chemistry, and pathology he was specially well equipped for laboratory research. In 1906 he was chosen by the Colonial Office to succeed C. W. Daniels as Director of the Institute for Medical Research, Federated Malay States. During the ten years he occupied this post, Fraser made a series of valuable contributions to the study of tropical diseases; his researches in beri-beri, bacillary dysentery, and leprosy gained for him an international reputation. On his retirement from the Colonial service in 1916, he served in the Royal Army Medical Corps, first at Malta, and later at Salonica. After the war he was engaged in the Ministry of Pensions service in London and Birmingham as a consultant in tropical diseases. In consequence of impaired health he retired from active work a few years ago, and latterly he lived quietly at Leamington Spa. In 1926 he was admitted M.R.C.P. London.

Fraser was one of a distinguished group of pathologists trained at the University of Aberdeen under the inspiring influence of Prof. Hamilton. His work in the tropics received less in the way of formal recognition than was its due, but his name will be held in high honour by the colleagues who were privileged to be associated with him there. He would, perhaps, desire no other memorial.

HECTOR G. G. MACKENZIE, D.S.O., M.D. Durh.

THE death occurred suddenly on Saturday, July 19th, of Dr. Hector Mackenzie at his flat in West Kensington.

Hector Graham Gordon Mackenzie was educated at Winchester and the universities of Oxford, Edinburgh, and Durham. He graduated in Arts at Oxford in 1897, and at Edinburgh was demonstrator of physiology in Surgeons' Hall. In 1907 he graduated in medicine at the University of Durham, proceeding to the M.D. degree in 1913. His first medical appointments were in connexion with tuberculosis, and he was for a time house physician to the Brompton Consumption Hospital and assistant tuberculosis officer at Charing Cross Hospital. He was known publicly for his deep interest in boys' clubs, and many social workers are aware of the scheme which he projected for the development of medical control in these institutions. His views on the subject were published in a pamphlet entitled "Medical Control in a Boys' Club," while the practical experience which led him to form these views was gained as medical officer to the Hollington Boys' Club, with which he was connected for many years; he was also honorary medical officer to the Secondary Schools Camp Association. He was deeply attracted by the problems allied to medicine which arise out of the study of many aspects of mental healing, and wrote on this subject generally, and also on the influence of treatment at Lourdes.

During the war Dr. Hector Mackenzie was very active on more than one front in ambulance service, and attained the rank of Lieut.-Colonel R.A.M.C. He was widely known to a large circle of patients and friends, and, as will be gathered from this brief record, possessed a fertile mind and an enthusiasm for social causes.

PHILIP BRUNELLSCHI COUSLAND, M.B. Edin.

Dr. P. B. Cousland, who died in British Columbia on July 7th, was for many years editorial secretary of the Chinese Medical Translation Committee, and took an important part in the development of western medicine in China. Born at Glasgow in 1861, the son of James Cousland, he was educated at George Watson's College, Edinburgh, and Edinburgh University. After being house physician at Leith Hospital he went out to China, under the Presbyterian Church of England and the China Medical Missionary Association, to Swatow Hospital, in 1883. Three years later he transferred to Chaochowfu, where until 1906 he engaged in medical, evangelistic, and other work, including a great deal of translation. He then moved to Shanghai, his services being lent to the China Medical Missionary Association (now the China Medical Association) for the purpose of editing, translating, and publishing medical books in Chinese. He was President of the Association from 1910 to 1913.

"It was in 1890," writes a correspondent, "that Dr. Cousland became a member of the terminology committee of the Association, and the bulk of its work fell upon his shoulders. It largely lay with him to render in Chinese ideas and words wholly foreign to the Chinese language. The ideographs had each to be considered separately by the committee, before they were adopted or improved, and finally used in the work of the translation of foreign medical works in Chinese. The Chinese Government eventually itself took part in this task, and appointed a special committee to deal with the matter, on which the Medical Missionary Committee was represented. He was himself the author of 'English-Chinese Medical Lexicon,' and he translated Osler's 'Practice of Medicine,' Halliburton's 'Physiology,' and Younger's 'Insanity in Everyday Practice.'"

Dr. Cousland was twice married, first to Miss Susan Harrington, and secondly to Miss Ida Rebecca Luther. He retired from active work some years ago and settled at Victoria, B.C., where his younger son is in medical practice.

WORCESTER GENERAL INFIRMARY.—During 1892 there were 1941 admissions, an increase of 160, and the average stay was 19·7 days. New out-patients numbered 5983 (casualties 3366), an increase of 628. The average total cost of each in-patient was £6 11*s*. 11½*d*., an increase of 8*s*. 5*d*. upon the previous year, and the cost per occupied bed was £129 4*s*. 10½*d*., an increase of £12 2*s*. 10½*d*. In its second year the contributory scheme produced slightly more than £9000; the county membership is 11,000, and the Worcester city membership 14,000. It has been decided to raise the number of beds from 118 to 150, with a further increase to 200 as means become available.

MEDICAL NEWS

University of London.

At a meeting of the Senate on July 16th Dr. Samson Wright was appointed to the university chair of physiology at Middlesex Hospital Medical School.

Dr. Wright was formerly a student of this school and qualified in 1920. He graduated as M.D. Lond., and became a Member of the Royal College of Physicians in 1925. At the Middlesex Hospital, besides holding clinical appointments, he was formerly senior demonstrator of physiology, but since last autumn he has been lecturer in physiology at King's College. His original work has followed several branches of applied physiology and his text-book on this subject is familiar to advanced students.

The title of Professor was conferred on Dr. J. G. Thomson (Medical Protozoology), and Dr. G. S. Wilson (Bacteriology as applied to Hygiene), in respect of their posts at the London School of Hygiene and Tropical Medicine.

Mr. Alexander Robertson, Ph.D. Glasg., was appointed to the university readership in biochemistry, tenable at the London School of Hygiene and Tropical Medicine.

It was resolved to institute a university chair of radiology, tenable at the Cancer Hospital, Fulham-road, S.W.

The degree of D.Sc. has been conferred on Mr. R. K. Cannan and Mr. S. A. Mann (Biochemistry) and on Miss May Smith (Industrial Psychology).

The Senate have resolved to institute a Diploma in the Theory and Practice of Physical Education.

University of Edinburgh.

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

N. J. Abbensetts, A. Amdor, A. J. Bain, B. Berger, James Black, D. M. Blair, A. B. Brereton, A. Brookner, G. J. F. Caley, A. C. P. Campbell, M. Chamurich, D. S. Clark, P. de Beer Clark, W. S. M. Craig, S. Davidson, J. S. de S. Drummond, E. H. Duff, S. Eisenhammer, W. R. de Faria, M. H. Finkelstein, G. S. Forrester, A. K. Fraser, E. M. Fraser, P. Fraser, D. N. Gibbs, J. C. Gibson, J. J. Glover, F. G. Goulder, M. C. Gray, James Guthrie, J. A. Guy, S. Harwitz, A. G. Hill, C. H. Howat, G. J. Hugo, J. L. Hunter, J. C. A. Hunter, E. R. Jamieson, J. M. Jamieson, T. T. Jardine, J. S. Jeffrey, H. M. Johnston, R. Y. Keers, P. L. Lai-Fook, J. S. Lawrence, E. Lazarus, E. Seng Lee, M. J. Leiserowitz, M. A. Lockie, J. M. MacAlister, A. L. Macdonald, A. Macdonald, C. R. Macdonald, S. A. Macdonald, John Mackenzie, A. F. Mackenzie, C. Mackie, A. W. Mackinnon, J. M. MacLennan, P. A. Macleod, K. J. E. MacMillan, W. M. Martin, A. E. Milne, J. M. Modak, I. C. Monro, W. I. C. Morris, H. L. Morrison, I. H. C. Morton, R. B. Nelson, H. J. Newlands, J. A. Noble, J. M. Officer, D. Orr, H. O. Parkinson, M. E. Paterson, J. P. Pennybacker, H. A. Raeburn, P. L. J. C. Ransome-Wallis, R. A. Read, R. L. Renwick, A. N. Roxburgh, U. Schutzer, H. G. Scott Kerr, W. C. Service, T. I. Sibbald, I. H. Silverstein, D. W. G. Smith, C. N. T. Spowart, D. G. A. Stewart, H. Stewart, J. L. Swanston, A. Thomson, T. B. Tibbetts, J. S. Tough, G. Turner, R. E. Verney, L. S. Wakefield, E. S. Walker, R. Walmsley, George Watt, E. J. Welford, A. D. Wilson, T. T. B. Wood, and J. Yunibandhu.

Royal College of Surgeons of Edinburgh.

At a meeting of the College on July 22nd, with Dr. James Haig Ferguson, the President, in the chair, the following 22 successful candidates (out of 73 entered) who passed the requisite examinations between March 27th and April 4th, were admitted as Fellows:—

Mahmoud Ismail Ashmawi, Percy Charles Edward Brunette, Conal Charleson, Arthur Charles Copley, Arthur Brython-Davies, James Dick, Colin Archibald Ferguson, James Paton Galloway, Douglas Medlicott Gibson, Thomas Jordan Gibson, Austen Henry Holmes, John Black Hutchison, Calverley Middlemiss Jennings, Lekhraj Rochiram Lalwani, Alistair Campbell McEachern, Hamish Falconer Masson, John Wright Nankivell, Harold Keith Pavy, William Bernard Roantree, Eric Thomas Sutherland Rudd, Peter Dewar Thomson, and Alister Laird Young.

The Ivison Macadam memorial prize, consisting of a bronze medal and a set of books, was, after a competitive examination in organic chemistry, awarded to Mr. Eng Tay Oon.

Royal College of Physicians of Edinburgh.

A quarterly meeting of the College was held on July 15th, with Sir Norman Walker, the President, in the chair. Lieut.-Colonel W. F. Harvey and Dr. Arthur Oliver Gray were introduced and took their seats as Fellows. Dr. H. L. Wallace (Edinburgh), Dr. William Brown (Aberdeen), and Dr. H. E. Whittingham (Halton, Bucks) were elected to the Fellowship.

It was announced that Dr. D. K. Henderson, of Glasgow, had been appointed Morison lecturer for 1931.

Ulster Medical Society.

The following office bearers have been elected for the session 1930–31: President: Mr. Henry Hanna. Vice-Presidents: Prof. C. G. Lowry, Dr. Craig (Bangor). Secretary: Dr. J. A. Smyth. Assistant Secretary: Dr. F. P. Montgomery. Treasurer: Dr. F. M. B. Allen. Librarian: Dr. S. Simms.

A Course in Surgical Tuberculosis.

Under the direction of Dr. Etienne Sorrel a course in surgical tuberculosis and orthopædics will be held at the Hôpital Maritime de Berck Plage, Pas-de-Calais, from August 4th to 16th. Particulars may be had from Dr. Delahaye at the hospital.

Ross Institute and Hospital for Tropical Diseases.

A meeting was held at the institute on July 9th, when the annual report and accounts of the institute for 1929 were presented (see THE LANCET, May 3rd, 1930, p. 976). Sir Charles McLeod, who presided at the meeting, said that the institute had made substantial progress during the past year under the general direction of Sir Ronald Ross, who spent all his time there. The institute had become known as a prominent centre of research in the field of fungi and fungal diseases. The malaria department had helped both doctors and laymen with advice on antimalarial work, and visits had been paid by members of the institute to Rhodesia and South Africa. An important development since the annual report was published was the opening of a branch of the Ross Institute in Assam to carry out scientific and practical work on the prevention of malaria in Assam and parts of Bengal. Dr. G. C. Ramsay had been appointed director of this institute, and certain firms connected with local industries had agreed to finance it for three years. Dr. R. Mhatre expressed appreciation of the facilities given to visiting doctors to work at the Ross Institute.

Eleventh International Veterinary Congress.

This congress will be held at the Central Hall, Westminster, London, S.W., from August 4th to 9th. The official programme has now been issued. Twenty-six countries will be represented, and the discussions will cover a wide range. General meetings will be held in the mornings and will include discussions on foot-and-mouth disease, tuberculosis, infectious abortion, the relationship of the veterinary surgeon to animal husbandry, veterinary science in relation to public health, and the law governing the practice of veterinary medicine and surgery. In the afternoons sectional meetings will be held on variola in domestic animals; the use of drugs in the treatment of diseases caused by worms; theileriases; fowl typhoid and bacillary white diarrhœa; anthrax; swine fever; milk fever; fowl-pox; genetics; rabies; standardisation of biological products; acute infectious mastitis; control of trypanosomiases; deficiency diseases; black-leg; scientific feeding of animals; distemper; bovine sterility; rinderpest; treatment of parasitic diseases; diseases of the new-born; and fowl plague. Besides the scientific meetings a full programme of social functions has been arranged, and the delegates will be entertained by H.M. Government and by the Corporation of the City of London.

London School of Hygiene and Tropical Medicine.

A reception was given by the School at its new buildings in Gower-street on Friday, July 18th, to welcome members of the Colonial Office Conference. The guests were received in the library of the building by the chairman of the board of management, Sir Harry Goschen, and Lady Goschen, by the chairman of the court of governors, Sir Holburt Waring, and Lady Waring, by the vice-chancellor of the University of London, Sir Gregory Foster, and by the Dean, Prof. W. W. Jameson, in the absence of Sir Andrew Balfour, who was unable to be present. H.R.H. Prince George was among the guests. A series of scientific exhibits was shown in the library by members of the staff of the School; there were technical demonstrations in the various laboratories; and an interesting lecture was given to a large group of the guests by Dr. P. A. Buxton on the modern developments of medical entomology. Other guests had an opportunity to see a fine cinema display in the main theatre, illustrating scenes from primeval life, the emergence of man as leader though pitted against formidable monsters, the fight to-day of man against a myriad of microscopical foes; and school life at the special schools of the Leyton Urban District Council. A large number of guests enjoyed the hospitality of the School.

University of Liverpool.

Dr. W. J. Dilling has been appointed professor of pharmacology.

Hospital Sunday.

Up to July 19th the amount received from the collections on London Hospital Sunday was £68,000.

World League for Sexual Reform.

The fourth congress of the World League for Sexual Reform on a Scientific Basis will be held in Vienna from Sept. 13th to 20th. The address of the organising committee is Postfach 63, Vienna I/15.

A Course on Radium.

Under the auspices of the University of Birmingham a post-graduate Course on Radium Therapy will be held at the General Hospital, Birmingham, from Sept. 22nd to Oct. 4th. Particulars will be found in our advertisement columns.

Harton Poor-law Institution.

The Ministry of Health recently held a local inquiry into complaints concerning the administration of this institution which now belongs to South Shields town council. In stating his findings the Minister says that the evidence suggested that there has been a certain laxity in administration, that no one in the hospital appeared to be definitely responsible for summoning a doctor to the receiving wards, and there was no visible indications there that a doctor was available and on duty. His general conclusion is that there is need for closer supervision.

Royal National Orthopædic Hospital.

Last year 354 in-patients were admitted, and their average stay was 275 days; their average weekly cost was £2 2*s*. 11*d*., with a total per head of £84 3*s*. 11*d*. In addition, 9253 out-patients were treated. The number of patients exceeded all previous totals, and further clinics have been established in various parts of the country in coöperation with the local authorities.

Dumping of London Refuse.

On July 17th Miss Susan Lawrence, Parliamentary Secretary to the Ministry of Health, received a deputation from Essex riverside local authorities affected by dumping of refuse from Greater London.

Mr. H. T. Muggeridge, M.P., spoke of the danger to health inherent in the present practice of forming huge, unsightly, and insanitary dumps in the areas bordering on London. An inter-party committee of Members of Parliament had been formed to press for immediate action. This committee welcomed the recommendation of the Departmental Committee on London Cleansing that there should be a central responsible body, but regretted that continuance of the present method of dumping was contemplated. If, however, dumping in some form must continue, then local authorities should have the right to veto the sites proposed, subject to appeal to the Minister. Mr. F. J. Cole, chairman of Hornchurch Urban District Council, said that the dumps fostered the breeding of rats and flies, and were a grave menace to the public health. The local authorities had little or no control over them. They wished to press for legislation prohibiting further dumping except with permission, and under the control, of the local authorities in the districts affected, any cost incurred by this supervision to be borne by the dumping authority or its contractors. The position had been acute since about 1922 when rapid development of the area began.

Miss Lawrence said she had herself been over one of these dumps, and she thought their existence was a public scandal. But she thought the local authorities had not yet made full use of their existing powers. They could proceed (1) under the nuisance provisions of the Public Health Act, and (2) under the power to make by-laws and obtain continuing penalties for infringement. Hitherto, so far as she was aware, no Essex authority had made by-laws on this subject. Some other areas had done so, and enforcement of the by-laws had resulted in improvement of the conditions. As to legislation, it was not only a question of the merits of the case; there was the very great difficulty that the committee had not been able to agree on the constitution of the central authority. This meant that any legislation was likely to be controversial, and the difficulty of finding Parliamentary time would be correspondingly greater. The Minister proposed to take up with the borough councils the committee's recommendation that dumping authorities should be pressed to discontinue the use of insanitary dumps for their refuse, and take measures to minimise the unsatisfactory conditions. Mr. Oldfield said that procedure by nuisance was useless because it presupposed a dump. Procedure under by-laws was far more promising. It would be more effective if higher penalties were provided, and if the courts had power to prohibit recurrence of the nuisance.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—McRobert Lecturer in Malignant Disease. £800.
Accrington, Victoria Hospital.—Hon. Anæsthetist.
Altrincham General Hospital, Cheshire.—Sen. H.S., and Jun. H.S. At rate of £150 and £120 respectively.
Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.
Barnsley, Beckett Hospital and Dispensary.—H.P. £140.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal United Hospital.—H.P. and Asst. H.S. Each at rate of £120.
Birmingham, Midland Hospital, Easy-row.—H.S. £200.
Birmingham Univ.—Walter Myers Travelling Studentship. £300.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120. Hon. Clin. Asst. to the Dermatological Dept. Also Hon. Med. Clin. Asst.
Bristol Royal Hospital for Sick Children and Women, St. Michael's Hill.—H.S. £125.
Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.
Chester County Mental Hospital.—Jun. Asst. M.O. £350.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100-£175.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Coventry and Warwickshire Hospital.—Two Res. H.S.'s. £150 and £125.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
Doncaster Royal Infirmary.—Three H.S.'s and one H.P. All at rate of £200.
Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.
Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100.
Evelina Hospital for Children, Southwark, S.E.—H.S. Also Cas. and Out-patient O. Each at rate of £120.
Glasgow Univ.—Samson Gemmell Chair of Medical Paediatrics.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. Also H.P. At rate of £175 and £135 respectively.
Grosvenor Hospital for Women, Vincent-square, S.W.—Res. M.O. At rate of £100.
Hertford County Hospital.—H.P. At rate of £150.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Huntingdon County Hospital.—H.S. £125.
Indian Medical Service.—Commissions.
Kingston-upon-Hull, City and County of.—Res. M.O. for City Hospital, Cottingham. £350.
Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool Heart Hospital.—H.P. £52.
London School of Hygiene and Tropical Medicine.—Research Studentships in Entomology and Protozoology. Each £250.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester, City of.—Jun. Res. Asst. M.O. At rate of £275.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Hon. Asst. Surgeon for Children.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Sen H.S. £250. Also Jun. H.S. At rate of £125.
Manitoba University.—Professor and Asst. Professor of Anatomy. $5000 and $3500 respectively.
Margate and District New General Hospital.—Res. M.O. £125.
Middlesbrough, North Ormesby Hospital.—H.P. £120.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.
Newark General Hospital.—Res. H.S. At rate of £175.
Newport, Mon., Royal Gwent Hospital.—Hon. Radiologist.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. £100.
Reading, Battle Hospital.—Asst. Res. M.O. £300.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Northern Hospital, Holloway, N.—Res. Out-patient Cas. O. and Anæsthetist. At rate of £70.
Saint Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—Res. Surg. O. At rate of £150.
Salford, Hope Hospital.—Res. Surg. O. £400.
Sheffield National Radium Centre.—Medico-Physicist. £600-£800.
Sheffield Royal Hospital.—H.S. to Ear, Nose and Throat Dept. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—H.S. At rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Southampton Borough Hospital.—Res. M.O. £350.
Swansea General and Eye Hospital.—Asst. Path. £100–£500.
Taunton and Somerset Hospital.—Jun. H.P. At rate of £100.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of Chest.—Asst. Res. M.O. At rate of £300.
Walsall General Hospital.—Cas. H.S. At rate of £120.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Jun. H.P. At rate of £100.
Wigan Royal Infirmary.—H.S. At rate of £150.
Willesden General Hospital, N.W.—Jun. H.S. £175. Also Registrars.
Windsor, King Edward VII. Hospital.—H.S. At rate of £100.
Wolverhampton Royal Hospital.—Cas. O., and Res. Anæsthetist. At rate of £125.
Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Linslade (Buckinghamshire), Stockton-on-Tees (Co. Durham), Wainfleet (Lincolnshire).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workman's Compensation Act for the Districts of the Middlesbrough, Stockton-on-Tees, Stokesley, and Guisborough County Courts (Circuit No. 2). Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than August 9th.

NOTES, COMMENTS, AND ABSTRACTS

THE EXHAUSTED CHILD.*

BY RICHARD C. CLARKE, O.B.E., M.B. BRIST., M.R.C.P. LOND.,

HON. PHYSICIAN TO THE BRISTOL ROYAL INFIRMARY AND HON. CONSULTING PHYSICIAN TO THE BRISTOL ORTHOPÆDIC HOSPITAL.

EXHAUSTION and its effects on children have been occupying my attention for some years, and it is my opinion that the exhausted child is a far commoner phenomenon than it used to be, and that the condition is most insufficiently recognised by our profession, by parents, and those to whom we entrust our children for education and upbringing.

It is a condition which shows well-marked physical signs which depend upon the general muscular atony both of the voluntary and involuntary muscles. The intensity of these signs depend upon the degree of muscular atony, and the signs are found at all stages of development in different cases. The most obvious and dramatic is that stance which is best described as "the child standing over itself." In fact, it maintains its upright position by the bony and ligamentous system rather than by muscle tone (Fig. 1). Other signs are hyperextension of the elbow (Fig. 2), which is best seen if the child is told to stand up with its arm extended. The hand takes up a position of extension of the fingers and flexion of the wrist (Fig. 3), and the scapular wing is prominent. In advanced cases the face is expressionless, though grimacing is not uncommon in slight cases. The abdomen is protuberant and the abdominal wall atonic.

FIG. 1.

Stance of exhaustion.

SYMPTOMS.

The Nervous System.—The nervous system dominates the picture, and Dr. H. C. Cameron in his classic, "The Nervous Child," and his other admirable writings on the subject, defines the stance that I am referring to as occurring only in the nervous child. It is perfectly true that the majority are the active-brained, active-bodied type of child, difficult to manage, wayward with an undue amount of negativism, and that they are emotional and introspective, but this is not true of all of them. My own view is that amyotonia is more a symptom of exhaustion, and that it may be produced by exhaustion in any given child, though the margin of error differs enormously with the individual child. Pyrexia is very common in these children. Some show undue pyrexia in trivial infections, and others run evening temperatures for which no cause can be found.

Cardiovascular System.—The symptoms referable to the cardiovascular system are common and important, and depend on the atony of the autonomic nervous system. They consist of pallor and frequent fainting attacks, symptoms associated in the public mind with anæmia and heart disease. The impulse of the heart beat is often heaving and diffuse, and the rate rapid. Accentuation of the first and second sounds and even systolic murmurs may be present. There is often well-marked sinus arrhythmia and there may be even extrasystoles. A further sign of vasomotor instability is the so-called "orthostatic" albuminuria.

Respiratory System.—Although I know that I differ from some observers, I do not think that this type of child suffers more from catarrh of the respiratory system than do other children.

FIG. 2.

Hyperextension of elbow.

Alimentary System.—Anorexia and capricious appetite are common, but more referable to the nervous system. These children, as has been pointed out by several observers, are specially liable to attacks of vomiting, so-called bilious attacks, which may be so severe as to pass on to true cyclical vomiting, a rare disease in my experience All sorts and types of dyspepsias are common, and a coated shiny tongue is the rule. Constipation, varied by attacks of diarrhœa, is common, and abdominal tenderness—most often over the splenic flexure—is often found.

Genito-urinary System.—I have already referred to the orthostatic albuminuria. Nocturnal enuresis, which is always a neurosis, is very common and sometimes intractable. In one child that I took into hospital for observation the bladder was often found half-way up the abdomen without any symptom or cause.

DIFFERENTIAL DIAGNOSIS.

Subacute Rheumatism.—These children are introspective, and make the most of their aches and pains. What child has not from time to time pains in the limbs? This is frequently mistaken for subacute rheumatism. It is not at all difficult to read into the physical signs indications of chronic rheumatic carditis. Dr. Carey Coombs [1] has called attention to the doubtful case, and although he himself is unlikely to go wrong in the matter, I think he runs the risk of misleading the ordinary practitioner when he says: "An increased area of impulse in itself, without alteration of the sounds commands respect," and he suspects "accentuation of the first sound at the apex or the second sound at the pulmonary base."

FIG. 3.

Extension of fingers.

Dr. Reginald Miller [2] has tried to rope this type of child into the rheumatic net, and seems to regard at

* A paper read before the Bristol Medico-Chirurgical Society.

[1] Brit. Med. Jour., 1930, i., 227. [2] Ibid., p. 230.

any rate a good proportion of them as cases of latent chorea. My view is the opposite; a child who has had chorea is always exhausted, and will conform to this type, but only the smallest proportion of these children are cases of chorea. It is well known and unarguable that rheumatic affections of the heart are very uncommon in the nurtured classes; any public school doctor would bear this out. In a secondary school for middle-class girls, I have examined and re-examined 1767 girls; of these at least 15 per cent. are of the grossly atonic type, and a further 20 per cent. show signs in a lesser degree, yet there have been only seven cases of rheumatic heart, an incidence of 0·4 per cent. This atonic type is lamentably common among the very well-to-do, and some of the worst cases are among the only children of the very rich. If these cases were really rheumatic in origin, surely there would be more rheumatic hearts amongst them.

Alimentary System.—The three favourite diagnoses are mesenteric glands, chronic appendicitis, and intestinal toxæmia. If the patients fall into the hands of the surgeon they seldom get away with their appendix intact, and are lucky if they escape without a pleat in their cæcum, a hitch in their transverse colon, or even a short-circuit in their alimentary tract.

Respiratory System.—The most frequent diagnoses are unhealthy tonsils and mesenteric glands. The latter is a harmless diagnosis, as the surgeon has not yet penetrated into this area, and the usual treatment of rest and hygiene is most beneficial. In the former there is more danger, and the plain man is here in a difficult position. There can be no doubt that an unhealthy tonsil is a danger, and should be removed; but what is a healthy tonsil? The current medical press produces mental confusion, and I do not believe that the ordinary rhinologist would admit that there is such a thing as a healthy tonsil over the age of 5. Enlargement of the tonsillar gland in the anterior triangle of the neck, if it be a test of unhealthy tonsils, is almost universal in children over that age. I am always glad when these children have had their appendix and tonsils out already, as it clears the air considerably.

Some gravitate to the orthopædic department of hospitals and remedial classes in schools, where they are treated with exercises. A great many orthopædic departments have realised the necessity of rest as an adjunct, though some have not. Exercises and re-education to the exhausted child are often just an additional burden.

THE GROUNDS FOR THE EXHAUSTION HYPOTHESIS.

I regard the symptom-complex as being produced only by exhaustion, mental or physical or both, and all treatment should be directed along these lines. The conclusion is the result of my observations in the nursery and in the hospital, of school-children and of parents.

Observations in the Nursery.—Anyone with a nursery will agree that the child who has been over-excited, has had too much pleasure, and is overtired, displays some or all of the symptoms that I have mentioned. Night terrors and nocturnal enuresis can be produced in most children by a game of bears before going to bed. It is a commonplace that after a party the child is difficult to manage, and all the tact is needed to prevent a "scene." Children differ very much, but every child has what is called a breaking-point. If carefully observed round Christmas-time, and after too many parties, a child can be seen to be adopting the typical stance.

In Schools.—In examining the girls of the secondary school, I have invariably noted the position, and recommended early bed, no homework, and a rest in the dinner hour for those with the atonic stance; parties and cinemas are forbidden, and no remedial exercises are done. Where these instructions have been carried out, the improvement has been invariable and sometimes dramatic, but where parents have not coöperated the results have been negligible.

In Hospitals.—I have from time to time admitted the most advanced cases for investigation, and have put them "through it," to find some organic cause for the disorder, invariably with a negative result. Nevertheless considerable improvement has always taken place, the result, no doubt, of physical and mental rest. Recently I have been admitting such cases for the sake of the rest only, with the most satisfactory results.

Parents and Families.—In my experience, the worst cases of exhaustion occur in the only children of anxious parents, and when I have had the opportunity of seeing the family it has been the eldest that stands worst. "The only son of his mother, and she was a widow," is perhaps the most intractable case of all. The sole explanation of the only and eldest child phenomenon is that it is never left alone, it is watched day and night, fussed over, and "brought up"—in the worst sense of the word. The alternative explanation, that only the eldest child is nervous, is improbable on the face of it.

WHY ARE CHILDREN EXHAUSTED?

It must be either that the modern child is more easily exhausted and can stand less than his parents, or that modern methods of upbringing and education are all wrong. The former view was put to me very strongly by the headmaster of a great public school in the course of a conversation, but one must always accept this view with reserve. It has been said by every generation since the Stone Age, and we all suffered from it in our youth. None of us think "that our house physicians and clerks know what it is to work as we did." Of course, the war is a common excuse of parents with this type of child. There can be no doubt that the parents of children of present school age were profoundly affected by the late war, no matter what part they were called upon to play in those stupendous times. Whether this could be a factor or no, I must leave to the expert biologists to argue and decide. I myself have an open mind on the matter, but if it be so it cannot be altered, and it simply means that the second factor, the upbringing and education, needs to be modified. My own opinion is that the blame lies entirely with this second factor. The modern child, from infancy upwards, leads far too strenuous a life. In the nursery it is "infant-welfared" from morning till night, it is surrounded with complicated toys and complicated picture-books designed to overtax its brains. In these days of motor-cars, even the street is an adventure.

In education parents pay the piper and the pedagogue calls the tune. Clifford Allbutt uttered many warnings against the cramming system of schools from the nineties, onwards, and since the war Sir Humphry Rolleston has continued the good work, but these are voices crying in the wilderness. We may take it as a fact that every pedagogue will overwork a child if he or she possibly can. Fortunately, most boys put up a defence, but girls, being more conscientious, are easier victims. Since the war the efficiency, in all schools—elementary, preparatory, secondary, and public—has been increased, and this increased efficiency has done away with the old type of pedagogue who, although he may have taught us nothing, at least rested our brains. May it not be that the nerves of the modern child are being sacrificed to efficiency and competition, though the general standard of education may be immensely higher?

TREATMENT.

The treatment of this condition can be summed up in one word: "rest," mental and physical. Directly the child is observed to be standing badly its burden must be lightened, any gross disease must be treated, tonsils, if really unhealthy, must be removed, errors of refraction must be corrected, and the teeth must be put in order. The whole system of Upbringing with a capital U, must be gone into and modified, and school work adjusted to the child's capacity. Early bed, midday rests, no parties or cinemas in term time, and as quiet a life as possible are all obvious precautions. Some of these measures may lead to

clashes with parents or pedagogue, but they must be insisted upon. In a really bad case I start the treatment with confinement to bed for a month. Much has been written by Dr. Cameron and his co-workers at Guy's lately with reference to diet; suffice it to say that these children take fats badly, and that eggs, cream, and cod-liver oil—so frequently ordered—are most unsuitable and most provocative of so-called bilious attacks and cyclical vomiting. The most suitable diet is mainly carbohydrates, with the addition of glucose. I have been trying glucose now for some years on these children, and am highly satisfied with the results. A cocktail containing glucose, soda bicarbonate, and potassium bromide, taken before a party, has given most excellent results.

CONCLUSIONS.

1. Amyotonia in children is a condition accompanied by well-marked physical signs and symptoms.
2. Although the majority of these children are inherently nervous, some are not.
3. The condition is produced by exhaustion, mental and physical.
4. It is curable by mental and physical rest.
5. It is a common condition in all classes, and is becoming commoner.
6. The standing position of any child is the most important clue to its mental and physical health.

THE DUTCH PESSARY.

To the Editor of THE LANCET.

SIR,—In the annotation on Birth Control in your last issue you refer to the difference in size of the Dutch pessaries used at different clinics in this country. I began using this pessary just nine years ago, and introduced it to the profession at a congress held in 1922. (See THE LANCET, 1922, ii., 195.) I have used it in several thousand cases since then, and kept many of my patients under regular observation for periods varying up to as much as nine years. The pessary is made in 19 (not 14) different sizes, varying from 45 mm. to 90 mm. diameter, and I began nine years ago by using large sizes—seldom below 70 mm. But greater experience soon taught me that these sizes were too large for most women. They are so big that they must lie *very* obliquely in the vagina, and any increase of intra-abdominal pressure is likely to dislodge them so that they come to lie longitudinally in such a way that they no longer occlude the vaginal vault at all. For many years now I have used much smaller sizes, usually from 55 to 70, sometimes from 50 to 55, and rarely below 50 or above 70—and have got much more satisfactory results.

Mrs. Florence, in her careful study of 247 cases from the Cambridge clinic, classes 155 as failures. But of these 155 only 16, at most, are failures of the contraceptive to prevent conception; and Mrs. Florence herself says that she suspects 4 of these 16 of not having carried out full instructions. The other 139, for one reason or another, did not use the method, and therefore, obviously, cannot be counted as failures. The methods advised were certainly successful, *when used*, in 76 cases out of 92—i.e., in 82·6 per cent., so that Mrs. Florence's pessimism seems a little exaggerated. It is probable that the sizes recommended at the Cambridge clinic are, on the average, too large—rather than too small as you suggest.

I have frequently seen women who had been fitted by other qualified practitioners with pessaries so much too large as to be uncomfortable and unreliable. Indeed, in many cases the pessary could not be wholly inserted into the vagina at all, but protruded from the orifice. Perhaps the blame for this partly belongs to me, because formerly I advised as large a size as would lie in the vagina without causing discomfort. I therefore take this opportunity of warning against using a size so large that it will not fit properly into the vagina at all, or will only fit so obliquely that it may be dislodged by any ordinary increase of intra-abdominal pressure, or by the passage of faeces through the rectum. Bulging of the rectum, due to extreme constipation, may dislodge even the best fitting pessary. While this pessary is fairly reliable when used alone, its reliability is increased if the patient smears it before insertion with a jelly containing 1 per cent. lactic acid ("Contraceptalene"), and douches next morning before and after removal of the pessary. I have never seen a case in which this method has caused any ill-effects, nor have I been able to trace any such case in the literature.

The intra-uterine ring, to which you refer, has already been proved in one case to be fallible, though, in so far as it requires no care or intelligence on the part of the patient, it represents an advance in technique. I am, Sir, yours faithfully,

Harley-street, W., July 19th, 1930. NORMAN HAIRE.

A PROTEST FROM REGISTERED NURSES.

The Managing Director of the *Nursing Mirror and Midwives' Journal* has written in connexion with the letter under this title in our issue of July 19th, taking exception to an advertisement which appeared in the *Nursing Mirror* on June 14th. The Managing Director says: "This particular advertisement unfortunately slipped through by an oversight, and was published in one issue of the paper. On the morning of publication the management returned an order for further insertions of the same advertisement. On July 8th we received the letter of expostulation from the Royal British Nurses Association. A reply, a copy of which we enclose, was sent to them by return of post. It was not until July 12th that their letter of complaint was sent to you." The letter enclosed contains both an explanation and expressions of regret.

A PAMPHLET ON SPA TREATMENT.

THE Harrogate Medical Society have issued a pamphlet designed for the medical profession on spa treatment in general and on its application in Harrogate. The nature, aims, and methods of spa treatment are discussed and cases suitable for this treatment are indicated. Doctors desiring to send patients to Harrogate will welcome especially the sections on the routine adopted there, the length of visit advised, and the cost of "the cure." The authors of the pamphlet acknowledge that there is a certain amount of scepticism amongst their professional colleagues as to the efficacy of spa treatment, but point out that there are no more confirmed advocates of this particular health régime than medical men who have tried it themselves. The pamphlet and any further information required can be obtained from The General Manager, The Royal Baths, Harrogate.

IN THE MATTER OF AGE-LIMIT.

To the Editor of THE LANCET.

SIR,—It is good science, and should be good politics, to reconsider evidence periodically from as nearly unbiased a point of view as possible, in order that one may check one's beliefs or working hypotheses, whichever one chooses to call them, and perhaps discover new laws or modify old ones to suit the new data. Osler's suggestion of senility at 40 was made as a joke, but in view of much experience in applying for posts in various parts of the British Empire, I find that we are regarded as too old at 40 for most of the public posts, whatever may have been our past experiences, or our admitted suitability for a post. If you will consider the advertisements in your own pages, you will usually find that any post in either a Government or a Local Government service is only open to people under 35 years of age. A few of the higher type are open to those up to 40, but anything over is disqualified. This is said, when one asks why, to be due to the rule that such posts are pensionable, and that one must contribute to some scheme 5 per cent. of one's gross salary—as well as 4s. 6d. in the pound to income-tax—and

that it is expected that one will be able to give at least 20 years' service, otherwise 20 years for 19 years' pay. One is not allowed to waive pension rights, and cover one's own old age pension in one's own way, neither may one, however likely to serve for 20 years, get into the service if over this age-limit. We have succeeded in lengthening our life period considerably, and professional people are presumably of the higher type of mind, and so likely to be useful to the community for longer than the average man of I.Q.100 or so. Why, then, are the experienced to be barred just at the time when they are most likely to serve their community or country best? All honour to the young and enthusiastic, but at least some of us are middle-aged and enthusiastic, and have in addition experience which the young cannot yet have. Is it not now time that these rules for barring the older people were reconsidered and amended to give a chance to all who would serve their community in a public capacity, provided they are well qualified to do so?

I do not sign my name for obvious reasons.

I am, Sir, yours faithfully,

EX-TEMPORARY CIVIL SERVANT.

TYPOGRAPHY.

THE introduction of new founts of type into the pages of THE LANCET, and the general enlargement of the type employed, has led to several inquiries as to the history of the different forms of printing. Anyone who consults the article entitled Typography in the Encyclopædia Britannica will see how special the subject is; the famous founts of France, Italy, Germany, and Holland have in some cases known origins, and certain names, such as those of Plantin and Elzevir in the sixteenth century, are as familiar as the name of William Morris in the nineteenth century in connexion with particularly beautiful designs. In answer to one particular question—what is the type that has been employed in the main headings of the different sections in THE LANCET, we have this information; it is called "Caslon open," and William Caslon, who was among the earliest of the well-known English type-founders, flourished during the first half of the eighteenth century. As an illustration of the loving care with which the early types were made we may quote a note on the subject we have received from the Lanston Monotype Corporation. Speaking of the Italian types of Arrighi and Blado, the note says "these were most probably cut by a famous goldsmith from Perugia, Lautizio de Bartolomeo dei Rotelli, mentioned with commendation by Benvenuto Cellini himself."

THE MEDICINE OF AVICENNA.

To the Editor of THE LANCET.

SIR,—In a note with this title, published in your issue of June 28th, the photograph, as you rightly surmise, illustrates the entry to a tomb; it is that of Avicenna himself, at Hamadan, in Western Persia. I wrote an article in 1913 for the *St. Bartholomew's Hospital Journal* on A Pilgrimage to the Tomb of Avicenna. It led to a scheme for the conservation of the tomb, largely due to the late Sir William Osler. The war put an end to it, but money was collected in Hamadan by the local doctors, and the tomb and little garden were put in order. I saw it in 1920 and have a photograph.

I am, Sir, yours faithfully,

Highate, N., July 6th, 1930. A. R. NELIGAN, M.D.

QUEEN MARY'S HOSPITAL, SIDCUP.—This hospital, which has been purchased by the London County Council, was opened by Princess Mary Countess of Harewood on July 21st. The hospital was formerly the Queen's Hospital for Facial Injuries, and has been expanded to form a convalescent centre for 500 male patients from the Council's hospitals. Mr. Arthur Greenwood, Minister of Health, was present, and Dr. F. Barrie Lambert, chairman of the Central Public Health Committee of the Council, spoke of the reasons why the hospital had been acquired and the use to which it would be put by the Council.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 28th, to SATURDAY, August 2nd.—INFANTS HOSPITAL, Vincent-square, S.W., Special Course in Diseases of Infants. Every afternoon from 2.0 P.M. Lectures and Demonstrations. Further particulars from the Fellowship of Medicine.

Appointments

BRYCE, A. G., M.D., Ch.B. Manch., F.R.C.S. Eng., has been appointed Hon. Asst. Surgeon to the Salford Royal Hospital.

HUME, N. H., M.B., B.S.Dub., Certifying Surgeon under the Factory and Workshop Acts for Brecon.

RENNIE, J., M.D., Ch.B. Aberd., D.P.H., Prof. of Public Health in Sheffield University.

SAVIN, L. H., M.B., B.S., M.R.C.P. Lond., F.R.C.S. Eng., Consulting Ophthalmic Surgeon to the Whipps Cross Hospital.

Bolingbroke Hospital Incorporated, Wandsworth Common: GRAINGER, R., F.R.C.S. Eng. and Irel., Resident Medical Officer; HARDWICK, S. W., M.B., B.S. Lond., House Physician.

London Lock Hospital and Home: HERITAGE, K., F.R.C.S. Eng., Surgical Registrar to the Male Lock Hospital; WILLIAMS, LESLIE, F.R.C.S. Eng., Hon. Surgeon to the Male and Female Lock Hospitals.

Queen Charlotte's Maternity Hospital: HALL, EDITH M., M.D., B.S. Lond., Medical Officer, Antenatal Department; LLEWELYN-JONES, MARGARET, L.R.C.P. Lond., M.R.C.S., Resident Medical Officer, Isolation Block.

Births, Marriages, and Deaths

BIRTHS.

COLLEY.—On July 7th, the wife of R. Colley, M.B., Ch.B., D.O.M.S., The Circus, Bath, of a son.

MILL.—On July 16th, at Wilbraham-place, Sloane-street, S.W., the wife of W. A. Mill, F.R.C.S., of a daughter.

MITCHELL.—On July 11th, the wife of Dr. J. Myles Mitchell, Kingscote, Yeovil, Somerset, of a son.

THORNTON.—On July 13th, at Lisnanagh, Forest Fow, Sussex, to Muriel Thornton, M.B., wife of G. Kennedy Thornton, M.B.—a son.

MARRIAGES.

BURTON—SPARK.—On July 19th, at Bedford, Edward Burton, M.R.C.S., L.R.C.P., to Enid, elder daughter of Mr. and Mrs. Hubert Spark, Chaucer-road, Bedford.

BURTON—WOODROFF.—On July 19th, at St. Mary's, Wimbledon, David Henry Burton, B.Sc., to Dorothy Lilian Woodroff, B.Sc., M.R.C.S., L.R.C.P.

GROSS—FAGGE.—On July 17th, at St. Marylebone Church, William Stovell Gross, M.D., M.R.C.P., to Alice Bell Metcalfe, eldest daughter of Charles H. Fagge, M.S., F.R.C.S., and Mrs. Fagge, of Devonshire-place, W.

WILLIAMS—THWAITES.—On July 17th, at the Parish Church, Aspenden, Dr. A. Gregson Williams to Marjorie Patience, eldest daughter of Mr. and Mrs. J. K. Thwaites, of Aspenden Lodge, Buntingford.

DEATHS.

ASHWORTH.—On July 11th, at Worthing, James Henry Ashworth, M.D., late of Halstead, Essex, aged 82.

DYKES.—On July 15th, at Riselaw-crescent, Edinburgh, Thomas Dykes, L.D.S.F.P.S. Glasg., late of Dumfries, in his 75th year.

FRASER.—On July 17th, 1930, suddenly, at Pitlochry, Perthshire, Henry Fraser, M.D., M.R.C.P., aged 56, of Morney, Northumberland-road, Leamington Spa, formerly of Kuala Lumpur, Malay States.

GROGONO.—On July 19th, in a nursing home at Frinton-on-Sea, Dr. R. M. Grogono.

MACKENZIE.—On July 19th, at his residence, Fitzjames-avenue, West Kensington, Hector Graham Gordon Mackenzie, D.S.O., M.D., J.P., Lieutenant-Colonel, R.A.M.C. (T.A.), aged 62.

MIDELTON.—On July 16th, suddenly, Dr. W. J. Midelton, L.R.C.P., M.R.C.S., L.S.A., of Charminster road, Bournemouth, aged 67.

WILLIAMS.—On July 15th, at Spilman-street, Carmarthen, Dr. Edward Richard Williams, M.B.E., aged 70.

WOOD.—On July 19th, at Lodore, Chelston, Torquay, Thomas Outterson Wood, M.D., in his 88th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.